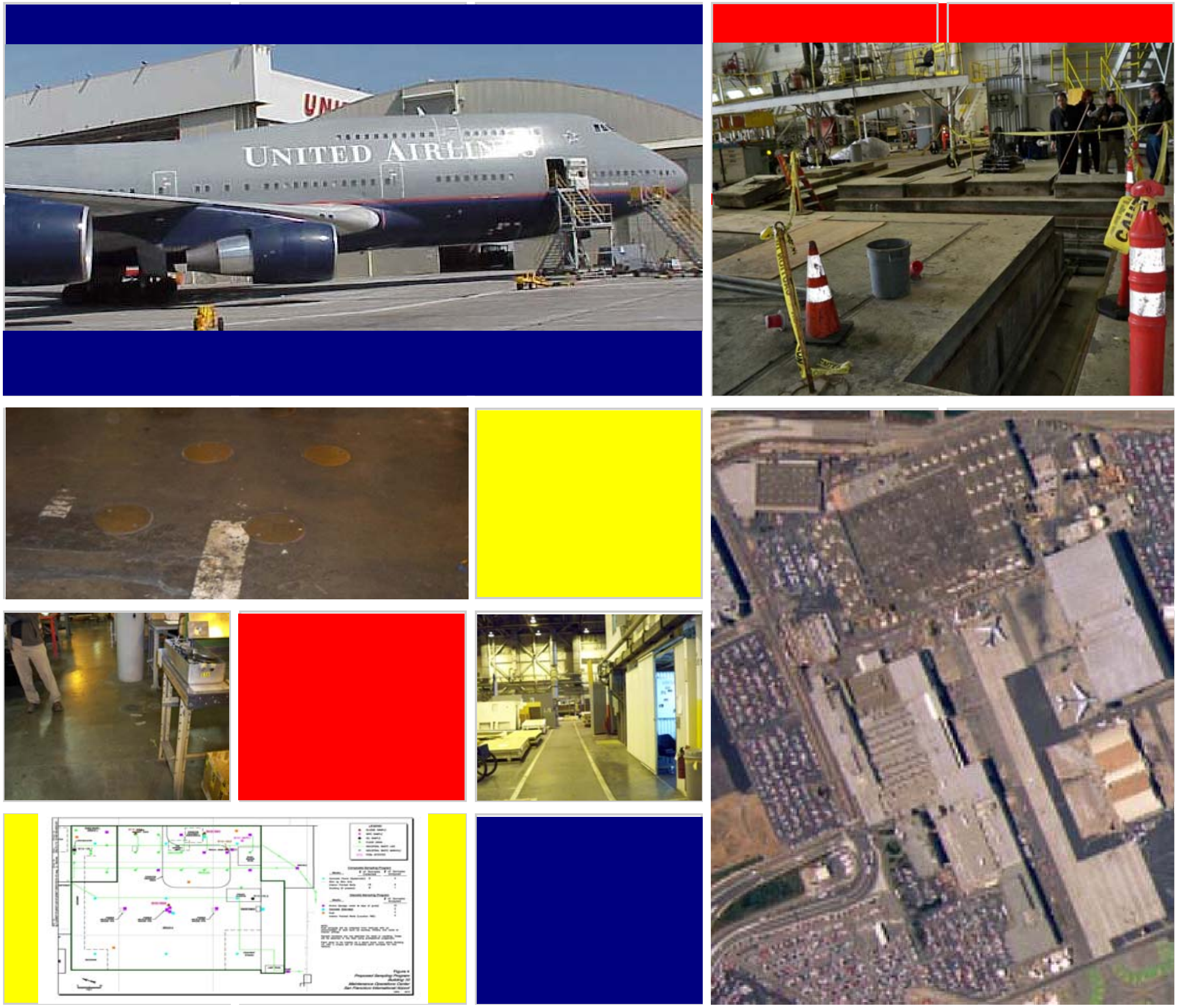

UNITED AIRLINES

PCB Investigation and Risk Assessment Workplan Addendum

United Airlines San Francisco Maintenance Center, San Francisco International Airport

Prepared for
United Airlines
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15 April 2011

Prepared by

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1.0 *INTRODUCTION*

On behalf of United Airlines (United), ERM-West, Inc. (ERM) has prepared this *PCB Investigation and Risk Assessment Workplan Addendum* (Addendum) for the San Francisco Maintenance Center (SFMC) at San Francisco International Airport (the "site"). This Addendum is intended to augment and revise the *PCB Investigation and Risk Assessment Workplan* (Workplan) submitted to the United States Environmental Protection Agency (USEPA) on 21 June 2010. ERM received comments to the Workplan from USEPA on 9 February 2011 and has prepared this Addendum in response to USEPA's comments. In addition, a formal Response to Comments letter has been prepared and is provided in Appendix A.

1.1 *ADDENDUM OBJECTIVES*

This Addendum has been prepared in response to USEPA's comments and is designed to supplement the Workplan and modify the original scope of work to further define the potential presence of polychlorinated biphenyls (PCBs) at the SFMC and the risk-based decision-making framework in which to evaluate the investigation data. The primary comments from the USEPA related to the quantity and type of samples proposed for characterization of paint and concrete media, with additional comments requesting clarification on sampling approach and procedures. This Addendum presents a revised approach to the supplemental investigation with the overall objective of implementing an adequate Sampling and Analysis Plan (SAP) to characterize the potential presence of PCBs at the SFMC.

1.2 *ADDENDUM ORGANIZATION*

Following this introductory section, this Addendum is organized as follows:

- Section 2 – Pilot Sampling Program;
- Section 3 – Revised PCB Sampling and Analysis Program;
- Section 4 – Reporting; and
- Section 5 – Revised Project Schedule.

2.0 PILOT SAMPLING PROGRAM

Concurrent with USEPA's review of the Workplan, ERM conducted a pilot study sampling event of Buildings 12 and 13 in accordance with the SAP presented in the Workplan. This September 2010 pilot study was implemented to gauge the adequacy of the proposed sampling plan as outlined in the Workplan and gain a real-world understanding of the level of effort necessary to complete the entire sampling program. Buildings 12 and 13 were selected for the pilot study due to their relatively small size compared to the other SFMC buildings, and their similar footprints and construction.

The pilot study included collection of concrete, paint, sludge, water, grate, and dust samples as shown on Figure 6 of the Workplan. The sampling results are summarized below.

Summary of Sampling Results

Sample Media	Building 12 Number of Samples	Building 12 Range of Sample Results	Building 13 Number of Samples	Building 13 Range of Sample Results	TSCA Screening Criteria	Units
Concrete	4	0.60 to 3.24	4	1.37 to 4.1	50	mg/kg
Paint	8	2.19 to 17.1	8	1.6 to 41	50	mg/kg
Sludge	2	0.22 and 0.32	1	3.5	50	mg/kg
Water	2	ND<0.095 and ND<0.47	1	ND<0.095	3	µg/L
Grate Wipe	2	ND<0.1 and 0.026	1	0.044	10	$\mu g/100\ cm^2$
Dust	1	0.13	1	2.8	10	$\mu g/100\ cm^2$

As shown above, all sample results were less than the Toxic Substances Control Act (TSCA) PCB Screening Criteria as summarized in the Workplan and listed in Table 2 of this Addendum. These sample results will be incorporated into the *Supplemental Investigation and Risk Assessment Summary Report* to be submitted to USEPA upon completion of the supplemental investigation.

2.1 ANALYSES OF PILOT STUDY DATA RELATED TO SAMPLING DESIGN

Comment 3 of USEPA's comment letter requested further explanation of the rationale for the paint and concrete sample densities. The stated concern was that the number of proposed samples in the Workplan may not be sufficient to adequately characterize these media for PCBs given the large size of the buildings. In response to this comment, ERM reviewed both our approach and the site-specific sampling results collected during the pilot study.

In our review of the pilot study results, we utilized simulations of various sampling efforts using the pilot study analytical data. The objective of this analysis was to determine an adequate, more robust, and statistically defensible sampling density (i.e., sample size) for paint on interior walls and concrete floors in each subject building within the SFMC. As discussed further below, ERM used these site-specific results to modify the sampling plan such that more samples would be collected in all buildings as part of the SFMC site characterization. A summary of the results of this analysis is provided in the sections below. Further details regarding the statistical analysis and associated results are provided in Appendix B.

2.1.1 Sampling for PCBs in Paint on Interior Walls

The original sampling program presented in the Workplan was designed on the assumption that the SFMC wall paint is largely homogenous and considered each building wall to be an individual feature. In response to USEPA's comments, we re-evaluated this approach assuming more heterogeneity with the paint media and an area-based sampling approach rather than a feature-based sampling approach. This evaluation is presented below.

A total of 16 discrete paint samples was collected from Buildings 12 and 13 and analyzed for total PCBs as part of the pilot study. As shown on Figure B-1 of Appendix B, concentrations of total PCBs in paint were determined to be log-normally distributed with a maximum concentration of 41 milligrams per kilogram(mg/kg). With this pilot study data set, simulations of sampling were conducted and upper bound estimates of total PCBs were calculated for different sampling efforts.

Figure B-3 illustrates the upper-bound estimates of total PCB concentrations as a function of sample size. These analyses indicate the following:

- Upper-bound estimates of total PCB concentrations in paint decrease with increasing sample size;
- There is a diminishing return on improved estimates of upper-bound estimates of total PCB concentrations in paint with sample size; and
- The point of diminishing return appears to be in the range of 16 samples per building.

These findings illustrate that, based on existing site-specific data, a minimum of 16 samples is appropriate for characterizing total PCBs in paint in buildings the size of Buildings 12 and 13. Assuming that upper bound concentrations may be influenced by larger areas, collection of more paint samples is proposed for larger buildings on an area-weighted basis. Accordingly, as discussed further in Section 2.2.1, we propose collecting an additional eight samples from each of these two buildings to increase the total sample quantity to 16 for each building.

2.1.2 Sampling for PCBs in Concrete Floors

The original sampling program for concrete as presented in the Workplan assumed two potential sources of PCBs, including sealants applied to the concrete surface and releases of PCB-containing fluids. Accordingly, the concrete floor sampling program consisted of two elements to evaluate these two potential sources:

- The first element uses an area-based sampling grid for data collection to screen the entire floor surface for PCBs; and
- The second element consists of professional judgment-based sample locations, considering floor drainage patterns, previous PCB detections, historical and current oil storage areas, historical PCB transformer locations, mobile hydraulic equipment storage areas, and other features that would maximize the likelihood of detecting PCBs.

In response to USEPA's comments regarding the adequacy of our area-based approach for concrete sampling, we conducted a statistical analysis of the pilot study data collected in accordance with the Workplan. In support of this evaluation, the area-based concrete samples were analyzed as discrete samples rather than composites to provide an adequately large discrete data set to be statistically significant. This evaluation is presented below.

A total of eight discrete concrete floor samples was collected from Buildings 12 and 13 and analyzed for total PCBs as part of the pilot study.

As shown on Figure B-2 of Appendix B, concentrations of total PCBs in concrete were determined to be normally distributed with a maximum concentration of 4.1 mg/kg.

Figure B-4 illustrates the upper-bound estimates of total PCBs concentrations as a function of sample size. These analyses indicate the following:

- Upper-bound estimates of total PCB concentrations in concrete floor samples are well below the threshold of 50 mg/kg;
- Upper-bound estimates of total PCB concentrations in concrete floors decrease with increasing sample size;
- There is a diminishing return on improved estimates of upper bound estimates of total PCB concentrations in concrete with sample size; and
- Even when extrapolating the trend line to four samples per building, the upper-bound concentration is well below the threshold of 50 mg/kg.

As presented in the Workplan, our proposed approach for concrete floor characterization results in a minimum of four discrete concrete samples per building. The above analysis illustrates that the minimum sample size of four concrete floor samples from the floors of Buildings 12 and 13 is adequate to characterize the potential presence of PCBs within the concrete floor media for these buildings. Further, these findings suggest that the originally proposed area-based sampling approach is adequate for characterizing total PCBs in concrete floors (see Section 2.2.1).

2.2 *IMPLICATIONS FOR THE SAP*

The results of the above analyses were reviewed to determine the implications for the overall SAP. This section presents modifications to the paint and concrete sampling programs, and proposes a phased approach to allow for continued data analysis during the field investigation to ensure adequate sampling as a better understanding of the site-specific conditions is attained during the sampling effort.

2.2.1 *Proposed Modifications to Paint and Concrete Sampling Programs*

Modifications are proposed for both the paint and concrete sampling programs. With regard to paint, two notable modifications are being made. The first is elimination of composite sampling from the paint sampling program and a conversion to discrete analyses for all samples. This modification allows for a direct comparison of sampling data to TSCA standards and continued statistical analysis as new data are collected. The second modification is a conversion from the feature-based approach presented in the Workplan to an area-based approach. Given that Buildings 12 and 13 are the same size and the smallest buildings within the sampling program, these buildings will serve as the baseline sampling density for the overall sampling program. As illustrated in the table below, the actual number of paint samples to be collected in each building has been determined based upon the square footage of each of the four walls in each building and their ratio to the square footage of the walls in Buildings 12 and 13.

Proposed Paint Sampling Collection

Building	Area of Wall (ft^2)	Proposed Sample Quantity
12	5,260	16
13	5,260	16
10	13,880	42
10 Paint Shop*	4,100	16
11	9,000	26
14	6,600	20
15	14,660	44
29	13,040	38
47	21,120	64
72	7,060	22
84	34,740	106
	Total	**410**

* Building 10 Paint Shop only requires 12 samples based on area, but the statistical analysis showed a minimum of 16 samples was appropriate for characterization.

With regard to concrete, the above analysis demonstrates that the original area-based sampling plan with one floor sample collected within each square of a 50-meter grid superimposed upon the building footprint is appropriate for site characterization. The only proposed modification to the concrete sampling plan is to eliminate composite sampling and rely on discrete analyses for all samples. Similar to paint sampling, this modification allows for a direct comparison of sampling data to TSCA standards and risk-based levels, and continued statistical analysis as new data are collected. The combination of area-based discrete sampling and judgment-based sampling targeting both suspected locations of historical spills and oil-containing equipment provides adequate data collection density for each building, regardless of size.

2.2.2 *Phased Field Program*

United proposes implementation of this field program in a phased approach with the flexibility to modify the sampling program mid-course based on site-specific sampling results. We note that the SFMC is an extremely large facility and that the characterization of PCBs in paint for purposes other than disposal is an emerging field. The proposed paint characterization sample density has been largely statistically derived based on site-specific pilot study data, which currently indicate that PCBs greater than 50 mg/kg are not present in either paint or concrete in the first buildings sampled (Buildings 12 and 13). Our proposed approach to the site-wide field program implementation is to conduct sampling in the small and medium-sized buildings (Buildings 10, 11, 12, 13, 14, 15, 29, and 72) as Phase 1 and conduct the sampling of the largest buildings (Buildings 47 and 84) as a second phase of work (Phase 2). Prior to proceeding with Phase 2, we will review all analytical results from Phase 1 and conduct a revised statistical analysis of the area-based sampling programs for both paint and concrete, and may propose sample density adjustments based on the expanded site-specific data set. Such modifications would be proposed to USEPA for concurrence prior to implementation.

3.0 *REVISED PCB SAMPLING AND ANALYSIS PLAN*

As described in the Workplan, the proposed SAP has been developed in consideration of the risk assessment approach, usability of data collected in 2005, and the site characterization data gaps identified in the Workplan. The focus of the investigation is to further assess the extent of PCBs in high- and low-occupancy areas in maintenance buildings at the SFMC. This supplemental information will then be evaluated in accordance with the risk assessment approach presented in the Workplan to design appropriate remedial actions necessary to protect human health and the environment. These actions, if warranted, will be presented to the USEPA in a Risk-Based Disposal Approval Application.

Based on the USEPA's comments and the evaluation presented in Section 2 of this Addendum, ERM has modified the SAP to reflect a more robust and statistically defensible characterization approach, particularly for concrete and paint samples. Table 7 has been revised to reflect the discontinuation of composite sampling for concrete and paint samples, and the increase in the recommended quantity of paint samples to achieve a representative characterization of the presence of PCBs at the SFMC.

3.1 *REVISED SAMPLING PROGRAM*

The revised supplemental PCB investigation remains largely the same as that presented in the Workplan and utilizes a stratified and hybrid design to accommodate the different buildings, media, and sampling locations included within this investigation. This Addendum specifically focuses on revisions to the characterization of wall paint and the concrete floors. Also included in this Addendum is a revised sampling methodology for accumulated dust. This Addendum is intended to amend and supersede the paint, concrete, and dust sampling programs presented in the Workplan.

As request by USEPA, we reviewed our APEX screening evaluation as it relates to appropriate TSCA Screening Levels for the various media included in this sampling program. This review process identified one correction related to the presence of both used and unused oils, and the different TSCA Screening Levels for these two media. Table 2 has been revised to reflect this correction; however, no additional data were rejected based on this modification. Additional clarification regarding the selected TSCA Screening Levels for the various media is presented in the Response to Comments letter provided in Appendix A.

The revised SAP is summarized in Table 7, which provides an overview of the sampling program as it applies to each building of interest. Discrete sampling will be the primary data collection method for all media of interest, with the exception of caulking if present. Composite sampling has been discontinued for concrete and paint based on USEPA's comments and experience that the concrete coatings and paint applied to walls may not be as homogeneous as was previously assumed. Additionally, the use of composite sampling may not provide a statistically sufficient quantity of samples to adequately characterize possible PCB impacts within each building. Composite sampling will continue to be utilized for caulking (if present), as the application method of caulking installation should result in a homogeneous dispersion of potential PCBs in that medium.

Figures 4 through 12 present the revised specific sampling program for each building of interest, and include other pertinent information such as previous screening results, previous TSCA exceedances, and subsurface utility features. The sampling program and procedures for drains (water, sediment, and grates) remain unchanged from the Workplan and that document should be referenced when sampling those features and media. The text below is focused solely on paint, concrete, and dust sampling for which the SAP has been revised.

3.1.1 Paint

This Addendum proposes the collection of paint samples from randomly selected locations along interior walls of the buildings to a height of 10 ft. This area of interior wall surface is considered to provide an appropriate and representative sample because this portion of each wall is:

- Painted more frequently due to wear and tear associated with day-to-day facility operations, as well as to differentiate different work zones within the building;
- More likely to be directly contacted by aircraft and facility maintenance workers; and
- More likely to have been affected by a potential release PCB containing fluids.

Previously, two random locations were to be selected along each of four walls within a building for subsequent compilation into an 8-to-1 composite analysis. Based on USEPA's comments, and ERM's subsequent pilot sampling program and statistical analysis, the composite sampling has been discontinued. The number of samples per wall varies based on the square footage of each wall and extrapolating the results of the Building 12 and 13 pilot sampling efforts. ERM's statistical analysis showed that a minimum of 16 samples per building is recommended to provide adequate characterization. As shown on Table 7, the total number of discrete paint samples varies based on building size, from 16 samples in the smallest buildings to 106 samples in the largest building. Up to 410 total samples are currently proposed to be analyzed from the SFMC during the supplemental investigation, whereas the original Workplan proposed 22 samples to be analyzed. The paint sampling program is also summarized on Figures 4 through 12; however, specific sample locations are not shown and will be selected in the field.

Paint sample collection procedures are consistent with those described in the Workplan. When implementing the paint sampling program, samples will be collected down to the bare, unpainted surface of the wall or base material. Sample locations will be marked in case further sampling is required. Although a random sampling scheme is proposed for each wall, preference will be given to locations where chipping of paint is observed. Wipe samples may be collected at paint sample locations with PCB trigger exceedances for use in the Screening Human Health Risk Assessment (SHHRA).

3.1.2 Concrete Floors

Concrete floor samples will be collected as detailed within the Workplan. The only change to the sampling of this media is that none of the samples will be composited and all will be analyzed as discrete samples to provide a statistically sufficient quantity of samples. In addition, wipe samples may be collected at locations with PCB trigger exceedances for use in the SHHRA.

Figures 4 through 12 show the two different types of concrete samples. The sample locations based on the area-based grid layout are shown as blue circles and the discrete judgment-based sample locations are shown as blue squares. As shown, a total of 94 concrete floor locations will be sampled as part of the SFMC characterization, whereas the original Workplan proposed 46 samples to be analyzed.

3.1.3 Accumulated Dust

The Conceptual Site Model presented in the Workplan illustrates that dust inhalation is a complete exposure pathway for all three potential receptors (aircraft maintenance worker, facility maintenance worker, and construction worker). To address the concern that accumulated dust may contain PCBs; samples will be collected and analyzed for PCBs where dust is observed in sufficient amounts. As recommended by USEPA, the original dust sampling procedures have been revised to include collection of bulk dust samples in addition to wipe samples. These revised procedures are detailed in Section 3.2.3 below. Dust sampling locations were identified for all buildings, except Building 84, using professional judgment during recent field reconnaissance and focused on elevated areas with a high likelihood for containing accumulated dust such as roofing of hangar offices and the exterior of ventilation ducting. As shown on Figures 4 through 11, the number of proposed dust samples collected per building ranges from one to four. Due to the large size of Building 84, the dust sampling locations have not yet been identified and up to 10 sample locations will be selected in the field using professional judgment. The total number of dust samples to be collected in accordance with the Workplan is anticipated to be 30.

3.2 SAMPLE COLLECTION PROCEDURES

Multiple media types will be sampled as part of this SAP, including concrete, paint, sediment, fluid, and wipe sampling for non-porous media/dust. However, this section focuses solely on paint, concrete, and dust because the other media do not fall within the scope of this Addendum. The procedure and techniques for collection of paint, concrete, and dust samples are provided below and are consistent with procedures and techniques outlined in Title 40 of the Code of Federal Regulations, Part 761, Subparts N, O, and P and USEPA's guidance document *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs).*

3.2.1 Concrete Samples

Concrete sample collection procedures are detailed in Section 3.2.1 of the Workplan and are consistent with USEPA's above-mentioned guidance document.

3.2.2 *Paint Samples*

Paint sample collection procedures are detailed in Section 3.2.2 of the Workplan. At present, there is no USEPA guidance on the collection of paint samples for PCB characterization. Therefore, the procedures for the collection of paint (chip) samples have been based on the widely used American Society for Testing and Materials (ASTM) standard for lead-based paint characterization (ASTM 1729).

3.2.3 *Accumulated Dust Micro-Vacuum Samples*

Dust samples are anticipated to be collected at areas where dust accumulation is significant enough that wipe sampling procedures would be insufficient to collect all the dust at a given location. Therefore, excessive dust sample locations will first be sampled using micro-vacuum sampling procedures consistent with *ASTM D7144-05a Standard Practice for Collection of Surface Dust by Micro-vacuum Sampling for Subsequent Metals Determination*. Following micro-vacuum sampling, a wipe sample will be collected using the methods described in Section 3.2.5 of the Workplan. The results of the micro-vacuum and wipe samples will be combined to give a total PCB concentration for the particular location. The procedures for collecting dust samples using the micro-vacuum method are described below:

1. Affix the 100-square-centimeter template to the area to be sampled.
2. Assemble the micro-vacuum sampling device. This will entail attaching the filter to the filter holder, or utilizing a pre-weighed filter and internal capsule.
3. Close the sampling device to prevent leakage around the filter or into/out of the sampler.
4. Attach the collection hose to the filter holder.
5. Calibrate the sample train using a calibrated rotameter.
6. Attach the sample collection device/filter to the calibrated sampling pump using a piece of flexible tubing.
7. Activate the sampling pump and allow for suitable warm-up period. To ensure the specified flow rate is obtained, sufficient pump warm-up shall be determined by using a calibration check device as before.
8. Hold the sample collection nozzle immediately adjacent to the surface being sampled, but avoid actual contact with the surface. The inlet of the nozzle (cut at a 45° angle) should be approximately parallel to the surface being sampled.

9. Move the collection nozzle from one side of the sampling area to the other. The rate of movement of the nozzle across the surface shall be no more than 1 s/10 cm. Repeat this sweeping motion in the same direction until the entire sampling area has been "vacuumed" with the collection nozzle. If the nozzle becomes clogged during sampling, dislodge the obstruction using a clean knife or other suitable tool.
10. Repeat the above described procedure in a direction 90° from the initial sampling direction. Be sure to cover the entire sampling area.
11. Continue sample collection until a total of 1 minute of sampling time per 100 square centimeters is reached.
12. Use a separate, clean collection nozzle and filter holder for each micro-vacuum sample.
13. Following collection of a surface dust sample, disconnect the sampling assembly from the sampling pump and collection nozzle, and then turn off the sampling pump. When disconnecting and capping the filter holder, hold it upright to ensure that no loose dust is lost from the sampling assembly. After removing the connecting tubes, cap the inlet and outlet ends of the filter holder with plugs.
14. Place the filter holder in a suitable container for transport, such as a sealable plastic bag, or box.

3.2.4 Sample Equipment Decontamination

All reusable sampling tools and utensils will be decontaminated between samples using two decontamination buckets. The first bucket will contain a detergent (Alconox) and water solution. All sampling tools will be placed within the bucket and scrubbed with a stiff brush to remove any dust, dirt, or other debris. Next, all tools will be rinsed with water and hexane by pouring each solution over the tools into the second bucket. Each piece will be placed on clean towels and individually dried and inspected prior to reuse. All rinse waters will be contained and disposed of appropriately.

Lightly contaminated utensils may be wiped with a hexane-soaked cloth and hexane-rinsed for decontamination.

3.2.5 *Sample Handling and Chain-of-Custody*

All collected samples will be properly labeled, stored in water-tight baggies, and placed in chilled coolers for transport under proper chain-of-custody to the analytical laboratory.

3.2.6 *Laboratory Analysis*

The proposed laboratory analyses for each sampling medium are summarized on Table 8. This table has been revised for this Addendum and also provides the sample volume and detection limit requirements. Detection limits have been estimated such that they are less than anticipated risk-based screening levels for discrete samples or trigger concentrations for the composite samples (if caulking present at SFMC).

In addition, duplicate samples will be collected for quality control/quality assurance purposes at a ratio of one duplicate per 10 samples, applied to all media. Upon receipt of the analytical data, all laboratory reports will be reviewed by a chemist for data quality and usability.

4.0 REPORTING

As presented in the Workplan, all collected data will be evaluated and an assessment will be made regarding the need for further PCB characterization upon completion of this supplemental PCB field investigation and associated risk assessment. The need for additional characterization will be directly related to collecting data in support of the SHHRA, and the evaluation will be completed on a building-by-building, surface-by-surface, and medium-by-medium basis. If additional characterization is warranted, United may propose to USEPA Region 9 to conduct the additional sampling prior completing the supplemental investigation summary report. Examples of subsequent sampling efforts may include video inspection of drain lines and collection of additional samples from specific matrix types (e.g., concrete floor, paint, subsurface soil) for further characterization.

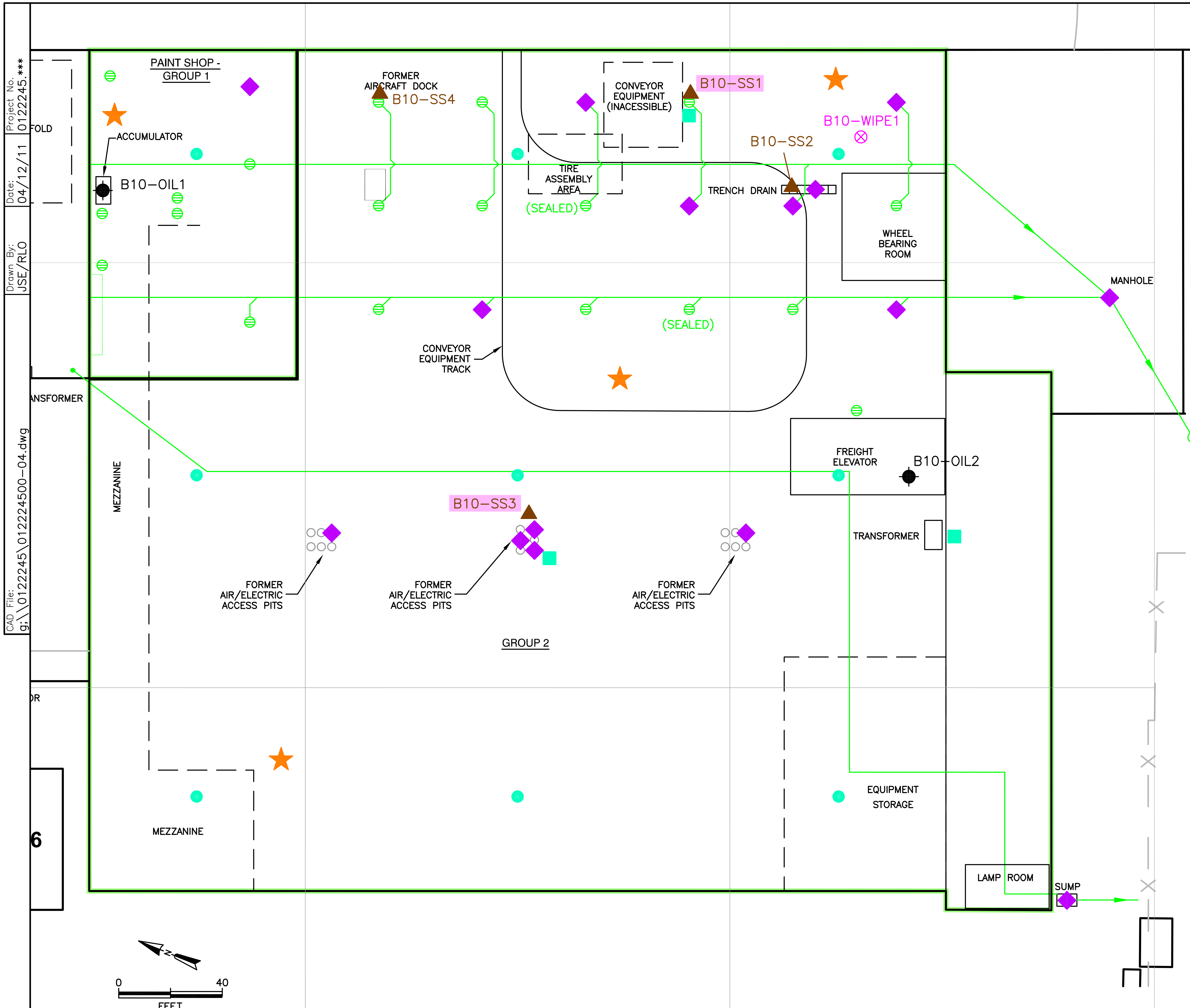
A summary report for submittal to USEPA will be compiled upon completion of site characterization and the associated risk assessment. The purpose of this report is to communicate the project results to USEPA to gain concurrence on the adequacy of site characterization and data evaluation prior to developing the Risk-Based Disposal Approval Application. The final field investigation and risk assessment summary reports will also be included as appendices to the Risk-Based Disposal Approval Application.

5.0 *REVISED PROJECT SCHEDULE*

The following estimated schedule has been revised from the version presented in the Workplan. This schedule presents an estimated timeline for the field investigation and risk assessment, and also includes project elements to be performed subsequent to the Workplan to provide USEPA with an overview of United's pathway through PCB remediation and project completion.

Task	Estimated Completion Date
USEPA Review of Workplan Addendum	13 May 2011
Comment Resolution	27 May 2011
Fieldwork Implementation	June and July 2011
Risk Assessment	2 September 2011
Investigation and Risk Assessment Summary Report Submittal to USEPA	30 September 2011
Meeting to Discuss Investigation and Risk Assessment Results, and the Proposed Approach to PCB Cleanup	October 2011
Risk-Based Disposal Approval Application to USEPA	December 2011
Comment Resolution	February 2012
Implementation of PCB Remediation	March 2012

Revised Figures



LEGEND

- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- INDUSTRIAL WASTE LINE
- INDUSTRIAL WASTE MANHOLE
- PCBs DETECTED

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	15
Concrete (Discrete)	3
Concrete Floors (Systematic)	9
Dust	4
Interior Painted Walls (Location TBD)	42
Interior Painted Walls Paint Shop	16
50m by 50m Grid	

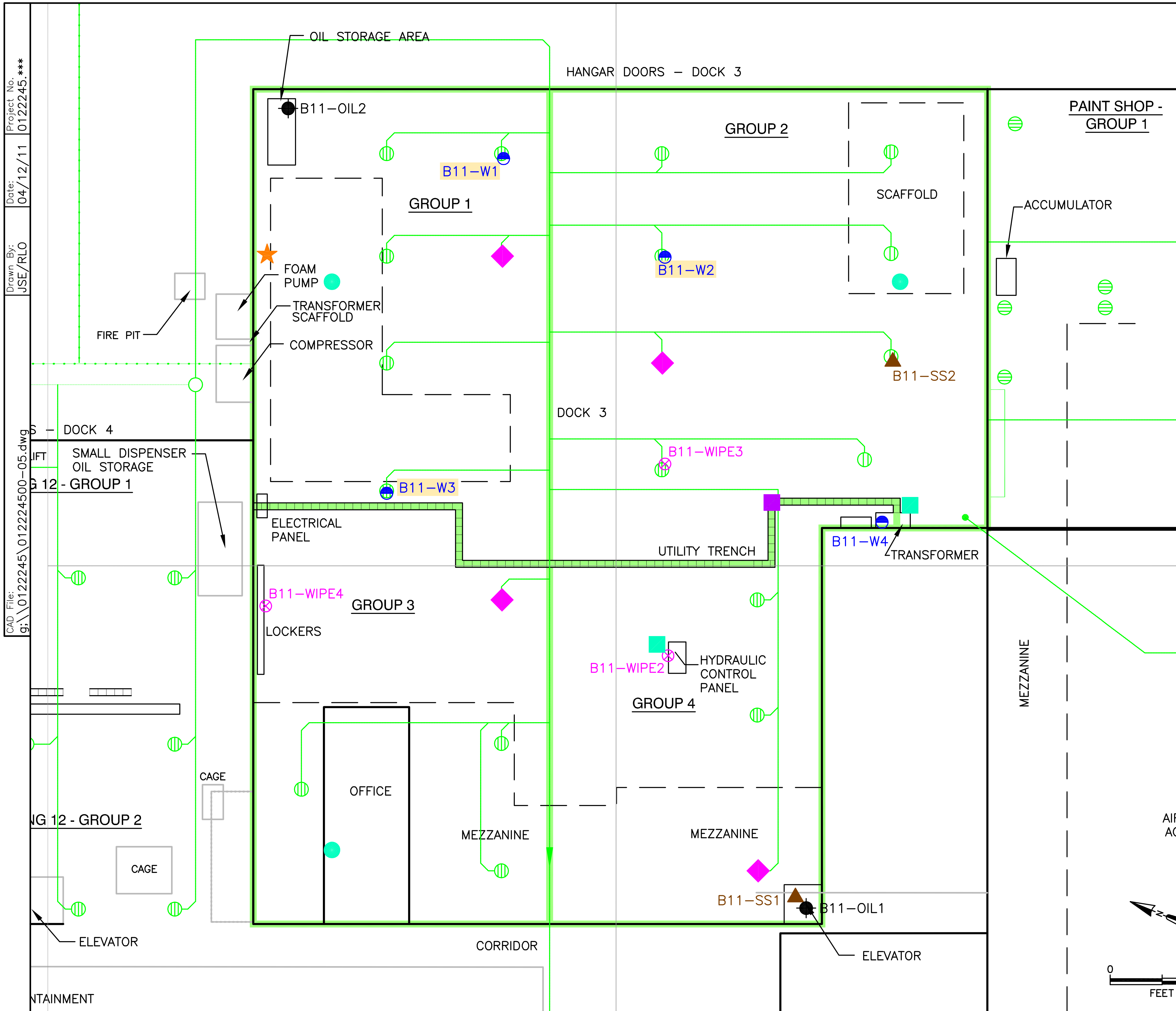
NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Paint shop to be treated as a stand alone room within Building 10, with a unique set of discrete paint samples for this feature.

Figure 4
Proposed Sampling Program
Building 10
Maintenance Operations Center
San Francisco International Airport

ERM *04/11*



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- STORM SEWER
- INDUSTRIAL WASTE LINE
- INDUSTRIAL WASTE MANHOLE
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	5*
Concrete (Discrete)	2
Concrete Floors (Systematic)	3
Dust	1
Interior Painted Walls (Location TBD)	26
50m by 50m Grid	

* 1 from each group, plus the utility trench

NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

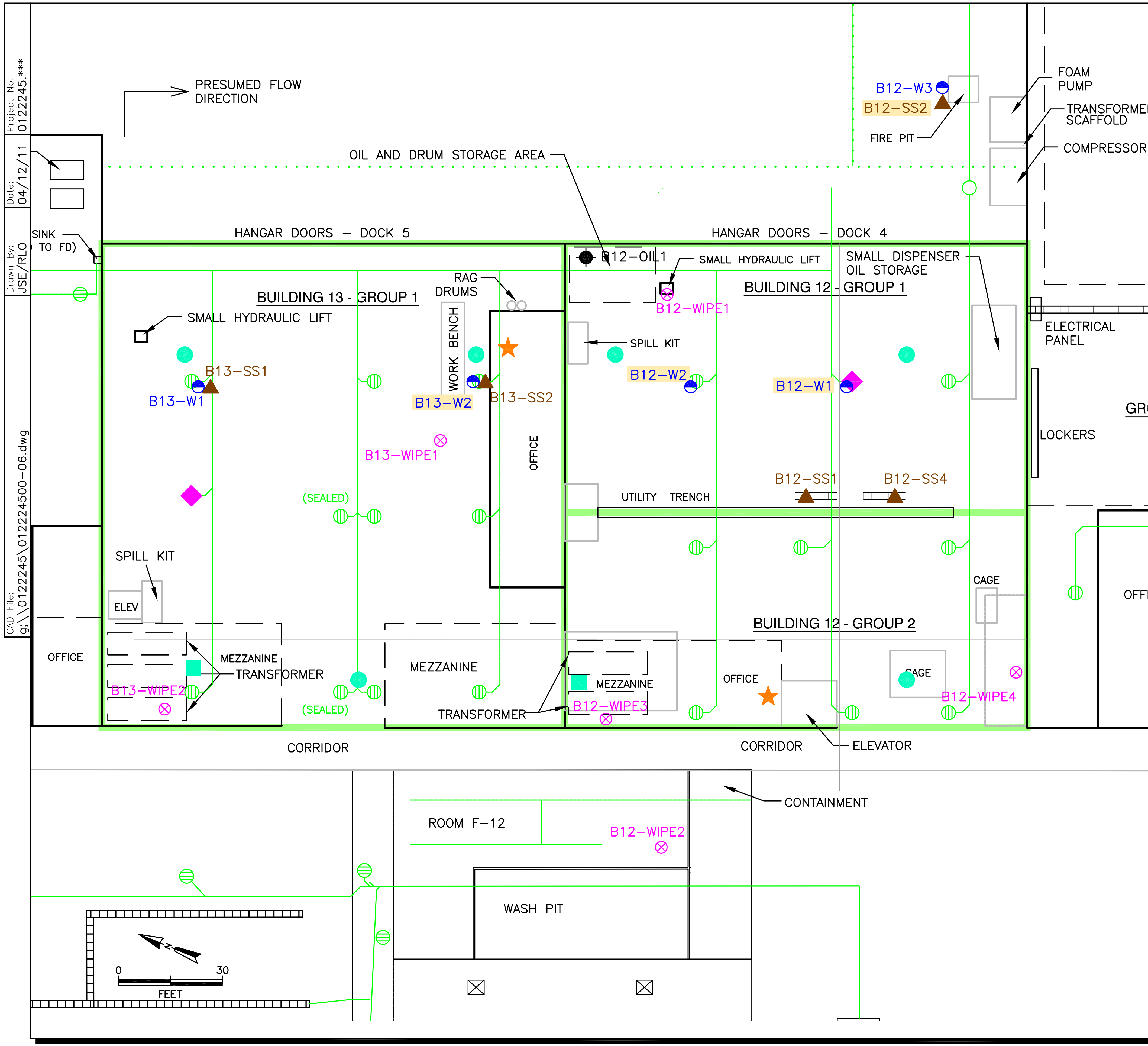
Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Trench drain grate, sludge, and water sampling approach assumes four groups as shown to augment the existing data. One representative sample has been randomly selected from each quadrant. In addition, discrete samples will be collected in selected drain and pit locations to confirm previous APEX data.

Figure 5

Proposed Sampling Program
Building 11
Maintenance Operations Center
San Francisco International Airport

ERM 04/11



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- STORM SEWER
- INDUSTRIAL WASTE MANHOLE
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	3*
Concrete (Discrete)	2
Concrete Floors (Systematic)	6
Dust	2
Interior Painted Walls (Location TBD)	32
50m by 50m Grid	

* 1 from each group

NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

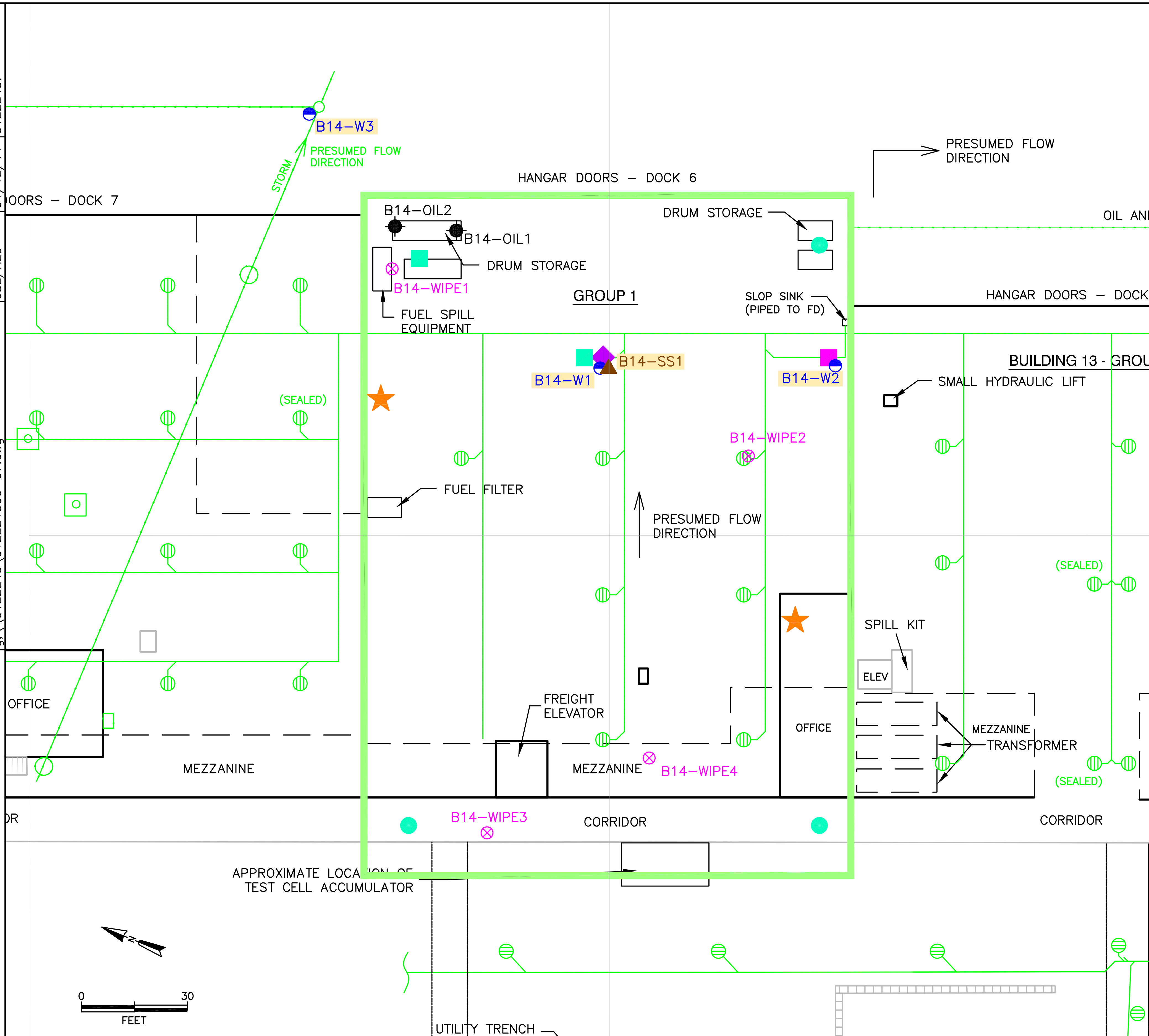
Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Trench drain grate, sludge, and water sampling approach assumes three groups as shown to augment the existing data. One representative sample has been randomly selected from each quadrant. In addition, discrete samples will be collected in selected drain and pit locations to confirm previous APEX data.

Figure 6
Proposed Sampling Plan
Building 12 and 13
Maintenance Operations Center
San Francisco International Airport

ERM *04/11*

Project No. 0122245.***
Date: 04/12/11
Drawn By: JSE/RLO
CAD File: g:\0122245\012224500-07.dwg



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- STORM DRAIN LINE
- STORM DRAIN MANHOLE
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	2
Concrete (Discrete)	2
Concrete Floors (Systematic)	3
Dust	2
Interior Painted Walls (Location TBD)	20
50m by 50m Grid	

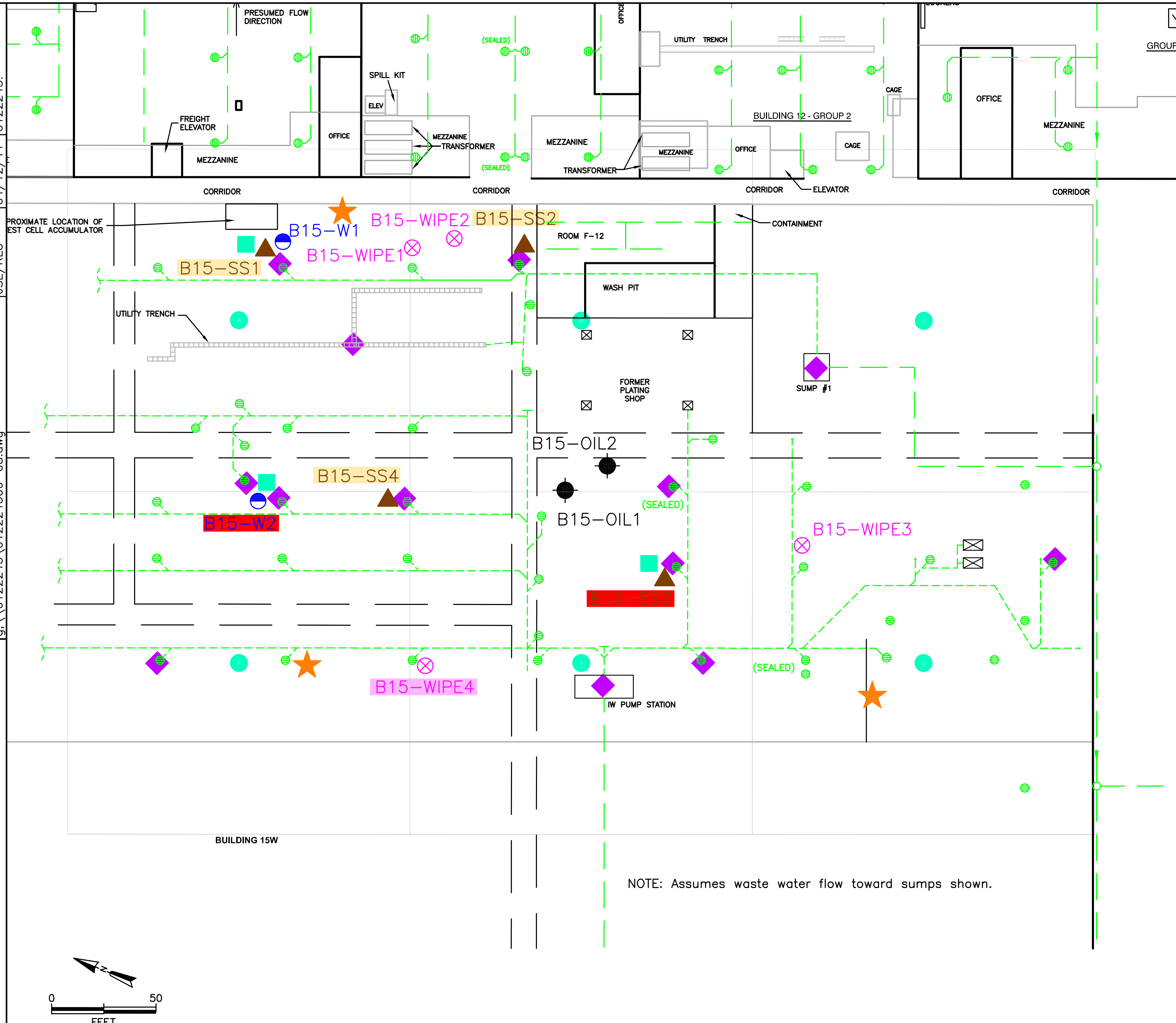
NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Figure 7
Proposed Sampling Program
Building 14
Maintenance Operations Center
San Francisco International Airport

ERM 04/11

Project No. 0122245.***
Date: 04/12/11
Drawn By: JSE/RLO
CAD File: g:\\0122245\012224500-08.dwg



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- INDUSTRIAL WASTE LINE
- INDUSTRIAL WASTE MANHOLE
- TSCA EXCEEDANCE
- PCBs DETECTED
- REJECTED FOR USE (See Table 1)

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	13
Concrete (Discrete)	3
Concrete Floors (Systematic)	6
Dust	3
Interior Painted Walls (Location TBD)	44
50m by 50m Grid	

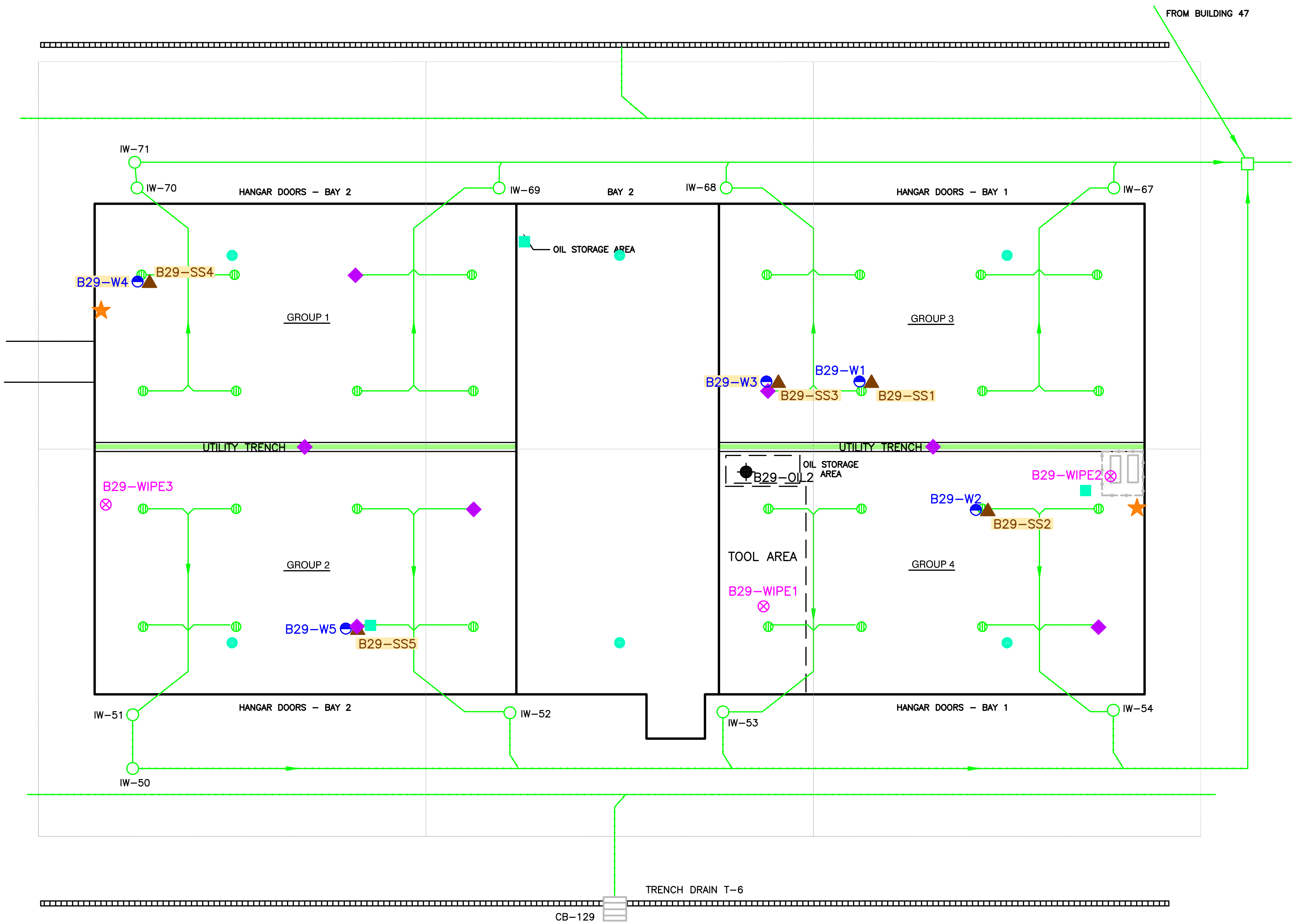
NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

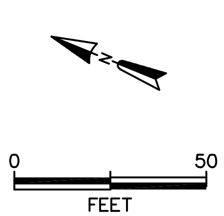
Figure 8
Proposed Sampling Program
Building 15
Maintenance Operations Center
San Francisco International Airport

ERM 04/11

Project No. 0122245.***
Date: 04/012/11
Drawn By: JSE/RLO
CAD File: g:\\0122245\012224500-09.dwg



NOTE
B29-OIL1 COLLECTED FROM ELEVATOR OIL ACCUMULATOR (NOT SHOWN).



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- INDUSTRIAL WASTE LINE
- STORM SEWER
- INDUSTRIAL WASTE MANHOLE
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	7*
Concrete (Discrete)	3
Concrete Floors (Systematic)	6
Dust	2
Interior Painted Walls (Location TBD)	38
50m by 50m Grid	

* 1 from each group, plus 3 shown on map

NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

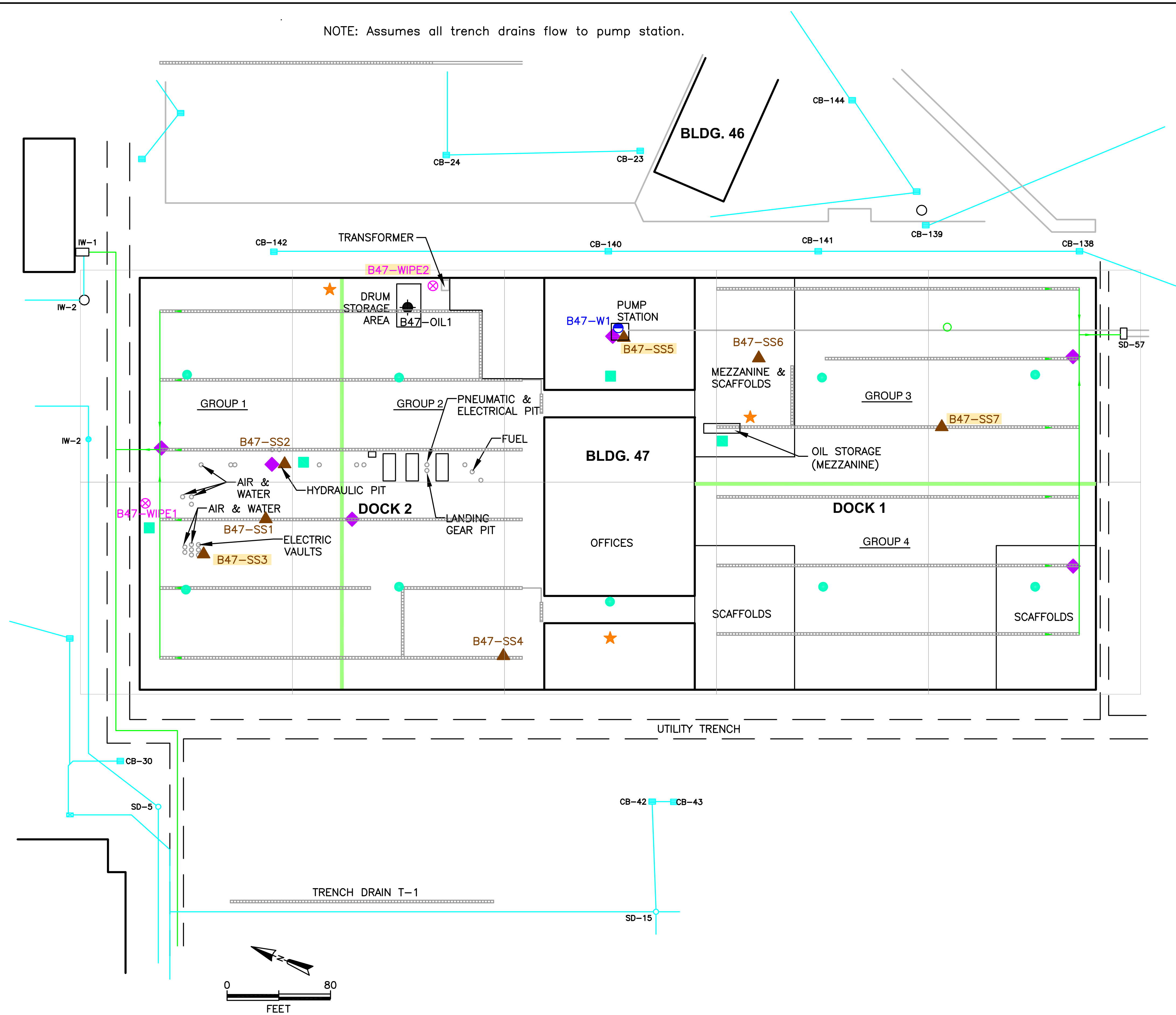
Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Trench drain grate, sludge, and water sampling approach assumes four groups as shown to augment the existing data. One representative sample has been randomly selected from each quadrant. In addition, discrete samples will be collected in selected drain and pit locations to confirm previous APEX data.

Figure 9
Proposed Sampling Progam
Building 29
Maintenance Operations Center
San Francisco International Airport

ERM 04/11

Project No. 0122245.***
Date: 04/12/11
Drawn By: JSE/RLO
CAD File: g:\0122245\012224500-10.dwg



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- TRENCH DRAIN
- CATCH BASIN.
- MANHOLE
- STORM DRAIN LINE
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	6*
Concrete (Discrete)	4
Concrete Floors (Systematic)	9
Dust	3
Interior Painted Walls (Location TBD)	64
50m by 50m Grid	

* 1 from each group, plus 2 shown on map

NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

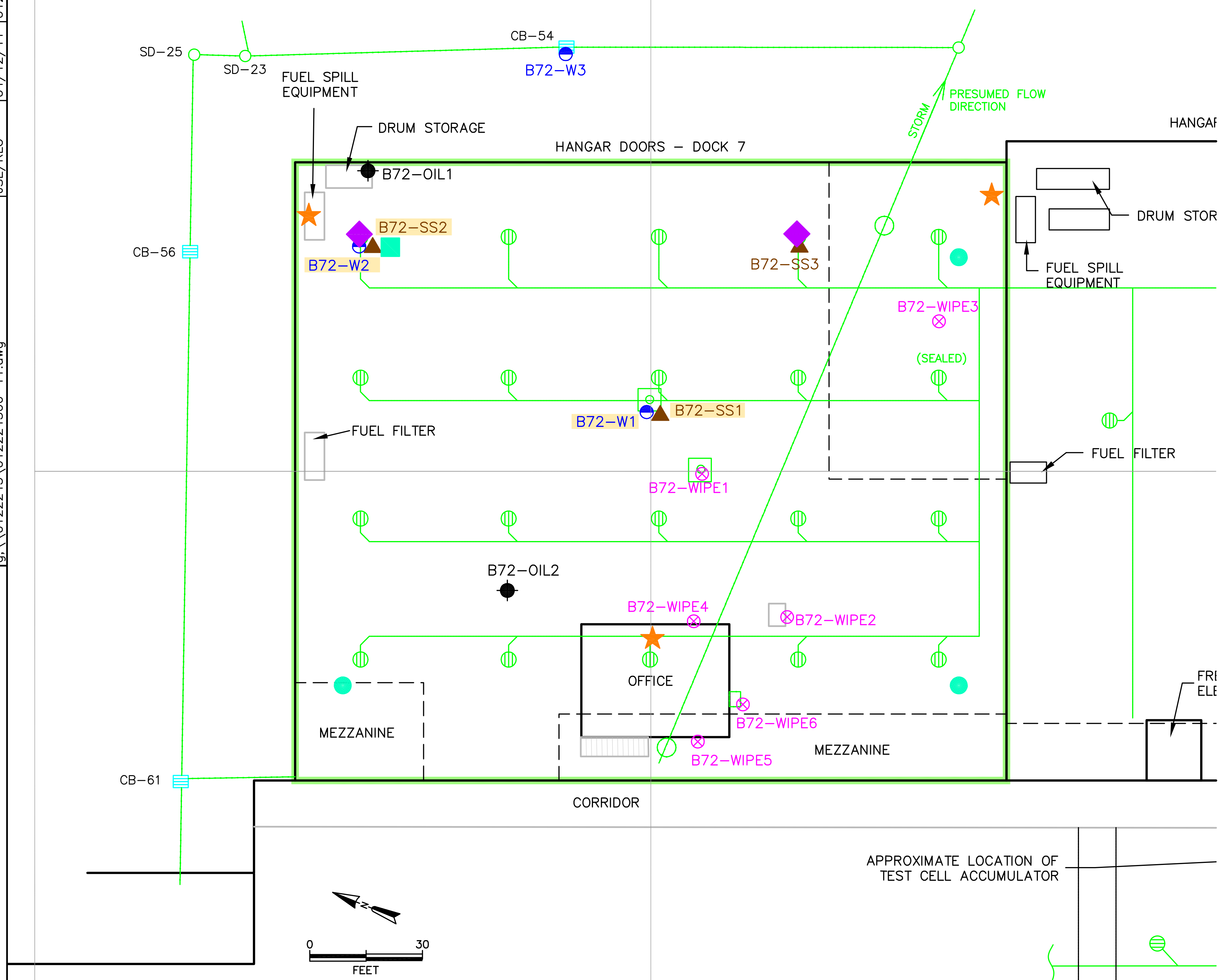
Trench drain grate, sludge, and water sampling approach assumes four groups as shown to augment the existing data. One representative sample has been randomly selected from each quadrant. In addition, discrete samples will be collected in selected drain and pit locations to confirm previous APEX data.

Figure 10

Proposed Sampling Program
Building 47
Maintenance Operations Center
San Francisco International Airport

ERM 4/11

Project No. 0122245.***
Date: 04/12/11
Drawn By: JSE/RLO
CAD File: g:\0122245\012224500-11.dwg



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- FLOOR DRAIN
- STORM SEWER
- INDUSTRIAL WASTE MANHOLE
- ELECTRIC PIT
- REJECTED FOR USE (See Table 1)

NOTE: No PCBs detected during APEX screening.

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	2*
Concrete (Discrete)	1
Concrete Floors (Systematic)	3
Dust	3
Interior Painted Walls (Location TBD)	22
50m by 50m Grid	

* 1 from the building, plus 1 shown on map

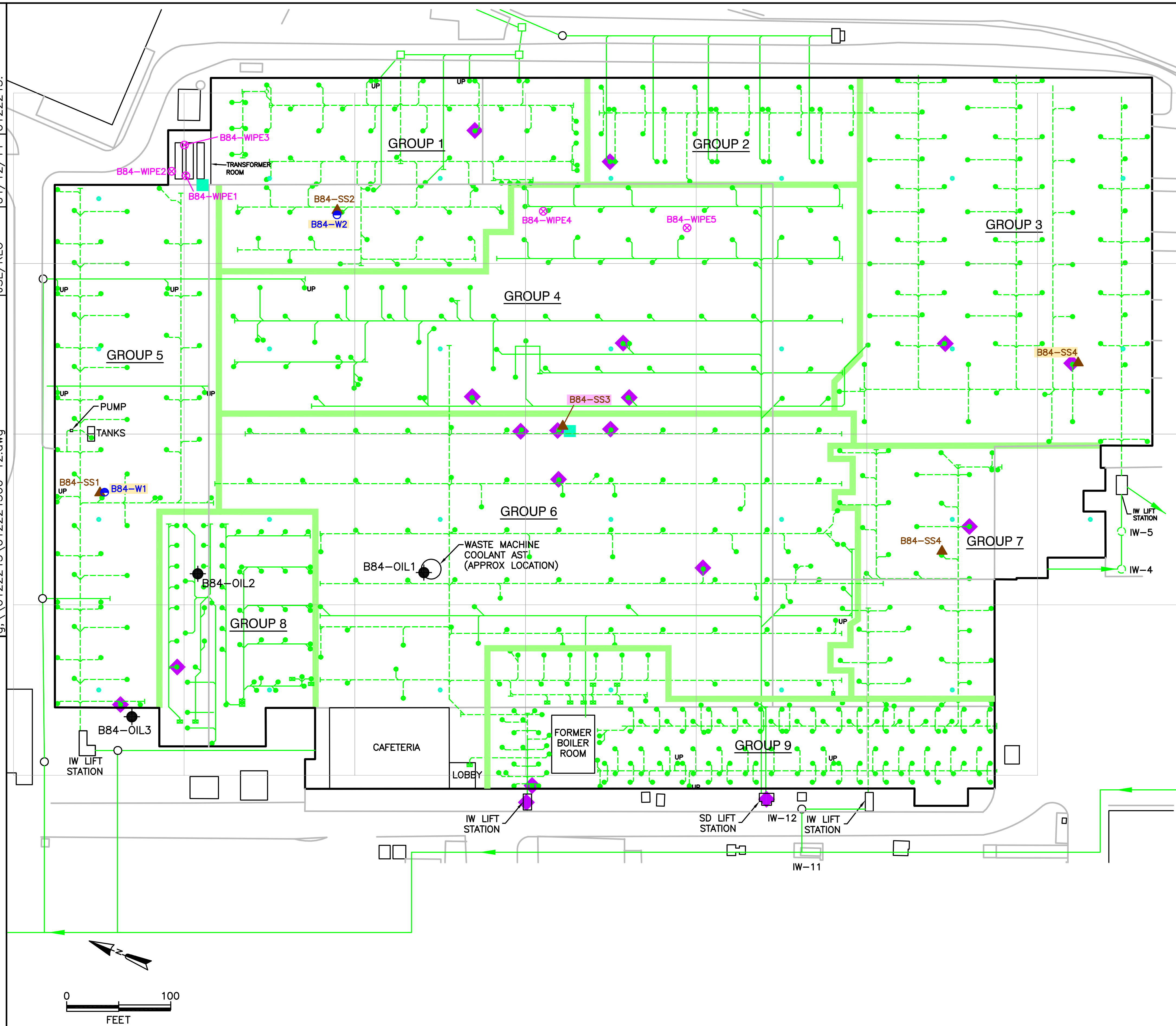
NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Figure 11

Proposed Sampling Program
Building 72
Maintenance Operations Center
San Francisco International Airport

ERM *04/11*



LEGEND

- WATER SAMPLE
- SLUDGE SAMPLE
- WIPE SAMPLE
- OIL SAMPLE
- INDUSTRIAL FLOOR DRAIN
- UP INDUSTRIAL FLOOR DRAIN FROM ABOVE
- STORM WATER FLOOR DRAIN
- UP STORM WATER ROOF DRAIN
- SUMP
- INDUSTRIAL WASTE LINE
- STORM DRAIN LINE
- STORM DRAIN MANHOLE
- PCB DETECTED
- REJECTED FOR USE (See Table 1)

Composite Sampling Program

Media	# of Samples Collected	# of Samples Analyzed
Caulking (if present)	8	1

Discrete Sampling Program

Media	# of Samples Analyzed
Drains (sludge, water & wipe of grate)	18*
Concrete (Discrete)	2
Concrete Floors (Systematic)	27
Dust	Up to 10
Interior Painted Walls (Location TBD)	106
50m by 50m Grid	

* 1 from each group, plus 9 shown on map

NOTE:
Dust samples will be collected from features with an accumulation of dust such as ducting, rafters, and roofs of interior offices.

Sample locations are not depicted for walls or caulking. These will be selected in the field using professional judgement.

Trench drain grate, sludge, and water sampling approach assumes nine groups as shown to augment the existing data. One representative sample has been randomly selected from each quadrant. In addition, discrete samples will be collected in selected drain and pit locations to confirm previous APEX data.

Figure 12

Proposed Sampling Program
Building 84
Maintenance Operations Center
San Francisco International Airport

ERM *04/11*

Project No. 0122245.***
Date: 04/12/11
Drawn By: JSE/RLO
CAD File: g:\0122245\0122224500-12.dwg

Revised Tables

Sample ID	Date	Location Description	Sampling Observation	Matrix	Porous/Non-Porous Assumption	Other Assumptions	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	EPA Rec. RLs	TSCA Screening Levels	Rejected For Use	Reason Rejected
Building 10 - Shops/Warehouse																		
B10-SS1	3/16/2005	Floor Drain	Conveyor area floor drain; unable to remove strainer; dry, debris	Sludge	--	--	µg/kg	<5,300	<5,300	<5,300	<5,300	<5,300	5,400	6,000	33	25,000	No	--
B10-SS2	3/16/2005	Floor Drain	Floor trench drain; dry, debris, sludge	Sludge	--	--	µg/kg	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	33	25,000	No	--
B10-SS3	3/16/2005	Pit	Access pit for hydraulic/electric/air; dry, debris, dust, sand	Sludge	--	--	µg/kg	<5,200	<5,200	<5,200	<5,200	<5,200	15,000	17,000	33	25,000	No	--
B10-SS4	3/16/2005	Floor Drain	Dry sludge scraped from pipe	Sludge	--	--	µg/kg	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	33	25000	No	--
B10-Oil1	3/16/2005	Elevator	Print shop freight elevator accumulator; yellow, clear	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B10-Oil2	3/16/2005	Elevator	Freight elevator oil accumulator; yellow, clear	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B10-Wipe1	3/16/2005	Floor Drain	Stained floor area	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	No	--
Building 11 - Dock 3																		
B11-SS1	3/16/2005	Floor Drain	Floor drain located in freight elevator shaft; moist to wet/black	Sludge	--	--	µg/kg	<690	<690	<690	<690	<690	<690	<690	33	25,000	No	--
B11-SS2	3/16/2005	Floor Drain	Dry sludge; possible hole in drain pipe elbow	Sludge	--	--	µg/kg	<690	<690	<690	<690	<690	<690	<690	33	25000	No	--
B11-Oil1	3/16/2005	Elevator	Dock 3 freight elevator accumulator; yellow, clear	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B11-Oil2	3/16/2005	55 gallon drum	Waste oil; brown, murky, odor	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B11-W1	3/16/2005	Floor Drain	Sample collected from strainer in floor drain; no sludge	Water	--	--	µg/L	<62	<62	<62	<62	<62	<62	<62	0.5	3	Yes	High Detection Limits[1]
B11-W2	3/16/2005	Floor Drain	Sample collected from strainer in floor drain; greenish-grey odor	Water	--	--	µg/L	<6	<6	<6	<6	<6	<6	<6	0.5	3	Yes	High Detection Limits[1]
B11-W3	3/16/2005	Floor Drain	Floor drain near tool box area; brown, opaque, slight sheen	Water	--	--	µg/L	<5	<5	<5	<5	<5	<5	<5	0.5	3	Yes	High Detection Limits[1]
B11-W4	3/16/2005	Pit	Pneumatic pit; approx 8 feet of water in pit	Water	--	--	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.5	3	No	--
B11-Wipe1	3/16/2005	Work Area	Locker room door	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B11-Wipe2	3/16/2005	Equipment	Hydraulic cart control panel	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	No	--
B11-Wipe3	3/16/2005	Floor Drain	Floor drain cover; under plane wing	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	No	--
B11-Wipe4	3/16/2005	Work Area	Locker door #106	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	No	--
Building 12 - Dock 4																		
B12-SS1	3/15/2005	Trench Drain	Sludge from north middle trench drain; slightly moist to dry	Sludge	--	--	µg/kg	<1,100	<1,100	<1,100	<1,100	<1,100	<1,100	<1,100	33	25,000	No	--
B12-SS2	3/15/2005	Trench Drain	Sludge from south trench drain; dry/grey-white/debris	Sludge	--	--	µg/kg	<530	<530	<530	<530	<530	<530	<530	33	25,000	No	--
B12-SS4	3/15/2005	Pit	Fire pit sediment/sludge; white, grey, sandy	Sludge	--	--	µg/kg	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	33	25000	No	--
B12-Oil1	3/15/2005	55 gallon drum	Waste Oil	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B12-W1	3/15/2005	Floor Drain	Sample collected from pipe/strainer; brown/little green, no odor	Water	--	--	µg/L	<69	<69	<69	<69	<69	<69	<69	0.5	3	Yes	High Detection Limits[1]
B12-W2	3/15/2005	Floor Drain	Sample collected from strainer; strong odor/green	Water	--	--	µg/L	<60	<60	<60	<60	<60	<60	<60	0.5	3	Yes	High Detection Limits[1]
B12-W3	3/15/2005	Pit	Fire pit liquid; red matter/froth floating on top	Water	--	--	µg/L	<5	<5	<5	<5	<5	<5	<5	0.5	3	Yes	High Detection Limits[1]
B12-Wipe1	3/15/2005	Equipment	Hydraulic lift surface	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B12-Wipe2	3/15/2005	Work Area	Locker Room door handle	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B12-Wipe3	3/15/2005	Transformer	Transformer door	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B12-Wipe4	3/15/2005	Work Area	Connector door Dock 3 to 4	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
Building 13 - Dock 5																		
B13-SS1	3/15/2005	Floor Drain	Floor drain (north corner); wet	Sludge	--	--	µg/kg	<770	<770	<770	<770	<770	<770	<770	33	25,000	No	--
B13-SS2	3/15/2005	Floor Drain	Floor drain (east corner); brown, no odor, frothy	Sludge	--	--	µg/kg	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	33	25000	No	--
B13-W1	3/15/2005	Floor Drain	Floor drain (north corner); wet	Water	--	--	µg/L	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.5	3	No	--
B13-W2	3/15/2005	Floor Drain	Floor drain (east corner); brown, no odor, frothy	Water	--	--	µg/L	<57	<57	<57	<57	<57	<57	<57	0.5	3	Yes	High Detection Limits[1]
B13-Wipe 1	3/15/2005	Work Area	Work bench table; next to vise	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B13-Wipe 2	3/15/2005	Transformer	Transformer door	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
Building 14 - Dock 6																		
B14-SS1	3/15/2005	Floor Drain	Floor drain under airplane (A/C tail); green liquid	Sludge	--	--	µg/kg	<9,300	<9,300	<9,300	<9,300	<9,300	<9,300	<9,300	33	25000	Yes	High Detection Limits[1]
B14-Oil1	3/15/2005	55 gallon drum	Waste oil drum	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B14-Oil2	3/15/2005	55 gallon drum	Skydrol 500 B-4 (virgin)	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	50	No	--
B14-W1	3/15/2005	Floor Drain	Floor drain under airplane; green liquid under A/C tail	Water	--	--	µg/L	<66	<66	<66	<66	<66	<66	<66	0.5	3	Yes	High Detection Limits[1]
B14-W2	3/15/2005	Floor Drain	Slop sink piped to Floor drain (FD/slop sink effluent)	Water	--	--	µg/L	<50	<50	<50	<50	<50	<50	<50	0.5	3	Yes	High Detection Limits[1]
B14-W3	3/15/2005	Storm Drain	Storm drain 22; concrete bottom/no sludge (exterior)	Water	--	--	µg/L	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	0.5	3	Yes	High Detection Limits[1]
B14-Wipe1	3/15/2005	Work Area	Fuel spill equipment box handle	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B14-Wipe2	3/15/2005	Floor Drain	Floor drain cover (under wing)	Wipe	Non-porous	Assumed unpainted Metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B14-Wipe3	3/15/2005	Work Area	Equipment storage shelf	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B14-Wipe4	3/15/2005	Equipment	Hydraulic power cart base	Wipe	Porous	Assumed Painted metal	µg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
Building 15 - Tire Shops/Carpets																		
B15-SS1	3/16/2005	Floor Drain	Floor drain (north of Accumulator) sludge sample collected from strainer; brown/black	Sludge	--	--	µg/kg	<12,000	<12,000	<12,000	<12,000	<12,000	<12,000	<12,000	33	25,000	Yes	High Detection Limits[1]
B15-SS2	3/16/2005	Floor Drain	Floor drain located near former hydraulic accumulator; dry, sludge/sand	Sludge	--	--	µg/kg	<18,000	<18,000	<18,000	<18,000	<18,000	<18,000	<18,000	33	25,000	Yes	High Detection Limits[1]
B15-SS3	3/16/2005	Floor Drain	Floor drain in former hydraulics area; sludge only; very dry, sandy	Sludge	--	--	µg/kg	<200,000	<200,000	<200,000	<200,000	<200,000	1,100,000	<200,000	33	1,000	No	--
B15-SS4	3/16/2005	Floor Drain	Floor drain in former landing gear area; moist to wet, grey/black, flies/bugs, consistency of pudding	Sludge	--	--	µg/kg	<16,000	<16,000	<16,000	<16,000	<16,000	<16,000	<16,000	33	25000	Yes	High Detection Limits[1]
B15-Oil1	3/16/2005	55 gallon drum	Waste Oil drum	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B15-Oil2	3/16/2005	55 gallon drum	Brayco Oil drum	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	50	No	--
B15-W1	3/16/2005	Floor Drain	water sample collected from pipe/strainer in FD near accumulator; brown/black	Water	--	--	µg/L	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58	0.5	3	No	--
B15-W2	3/16/2005	Floor Drain	FD in Former Brake Area; Greening-grey, sudsy, cleaner odor; no sludge	Water	--	--	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	41	0.5	3	No	--

Sample ID	Date	Location Description	Sampling Observation	Matrix	Porous/Non-Porous Assumption	Other Assumptions	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	EPA Rec. RLs	TSCA Screening Levels	Rejected For Use	Reason Rejected
B15-Wipe1	3/16/2005	Equipment	Control panel for accumulator - Accumulator Floor Area #1	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B15-Wipe2	3/16/2005	Work Area	Floor near accumulator - Accumulator Floor Area #2	Wipe	Porous	Concrete	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	Yes	Wipe Sample Insufficient for Characterization; Concrete core sample needed.
B15-Wipe3	3/16/2005	Work Area	Microfilm work station	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B15-Wipe4	3/16/2005	Floor Drain	Cover of floor drain (laydown area)	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	1.8	<0.25	-	10	No	--
Building 29 - Hangar (smaller aircraft)																		
B29-SS1	3/17/2005	Floor Drain	4 to 5' standing water; 6" sludge on bottom, strong odor (Bay 1 north-center)	Sludge	--	--	μg/kg	<30,000	<30,000	<30,000	<30,000	<30,000	<30,000	<30,000	33	25,000	Yes	High Detection Limits[1]
B29-SS2	3/17/2005	Floor Drain	4 to 5' standing water; 6" sludge on bottom, strong odor (Bay 1 center)	Sludge	--	--	μg/kg	<18,000	<18,000	<18,000	<18,000	<18,000	<18,000	<18,000	33	25,000	Yes	High Detection Limits[1]
B29-SS3	3/17/2005	Floor Drain	Very viscous oily sludge (Bay 1 north)	Sludge	--	--	μg/kg	<23,000	<23,000	<23,000	<23,000	<23,000	<23,000	<23,000	33	25,000	Yes	High Detection Limits[1]
B29-SS4	3/17/2005	Floor Drain	One inch black sludge on bottom (Bay 2 north)	Sludge	--	--	μg/kg	<11,000	<11,000	<11,000	<11,000	<11,000	<11,000	<11,000	33	25,000	Yes	High Detection Limits[1]
B29-SS5	3/17/2005	Floor Drain	Wet sludge; slight odor (Bay 2 west-center)	Sludge	--	--	μg/kg	<6,600,000	<6,600,000	<6,600,000	<6,600,000	<6,600,000	<6,600,000	<6,600,000	33	25000	Yes	High Detection Limits[1]
B29-Oil1	3/16/2005	Elevator	Freight elevator oil accumulator; white	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B29-Oil2	3/16/2005	55 gallon drum	Waste oil drum	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B29-W1	3/17/2005	Floor Drain	4 to 5' standing water; 6" sludge on bottom, strong odor (Bay 1 north-center)	Water	--	--	μg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	0.5	3	No	--
B29-W2	3/17/2005	Floor Drain	4 to 5' standing water; 6" sludge on bottom, strong odor (Bay 1 center)	Water	--	--	μg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	0.5	3	No	--
B29-W3	3/17/2005	Floor Drain	Strong old hydrocarbon odor (Bay 1 north)	Water	--	--	μg/L	<140	<140	<140	<140	<140	<140	<140	0.5	3	Yes	High Detection Limits[1]
B29-W4	3/17/2005	Floor Drain	Black liquid, sheen (Bay 2 north)	Water	--	--	μg/L	<5	<5	<5	<5	<5	<5	<5	0.5	3	Yes	High Detection Limits[1]
B29-W5	3/17/2005	Floor Drain	Water, slight odor (Bay 2 west-center)	Water	--	--	μg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	3	No	--
B29-Wipe1	3/17/2005	Work Area	hangar tool box area	Wipe	Porous	Assumed Painted metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B29-Wipe2	3/17/2005	Transformer	Sub Station 1 4397 - Switch panel (Bay 1 transformer)	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B29-Wipe3	3/17/2005	Work Area	Floor near external power for AC in south bay (Bay 2)	Wipe	Porous	Concrete	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	Yes	Wipe Sample Insufficient for Characterization; Concrete core sample needed.
Building 47 - Hangar																		
B47-SS1	3/17/2005	Trench Drain	Third row from bay door (Dock 1 center); dry sediment/debris	Sludge	--	--	μg/kg	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	33	25,000	No	--
B47-SS2	3/17/2005	Pit	Hydraulic outlet 2EA (Dock 1 hydraulic access port) - dry	Sludge	--	--	μg/kg	<14,000	<14,000	<14,000	<14,000	<14,000	<14,000	<14,000	33	25,000	Yes	High Detection Limits[1]
B47-SS3	3/17/2005	Pit	Electric 400 Hz power outlet (electric access port Dock 1) - dry sediment	Sludge	--	--	μg/kg	<7,200	<7,200	<7,200	<7,200	<7,200	<7,200	<7,200	33	25,000	Yes	High Detection Limits[1]
B47-SS4	3/17/2005	Trench Drain	First row (Dock 1 southwest) - dry, sediment, debris	Sludge	--	--	μg/kg	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	<5,100	33	25,000	No	--
B47-SS5	3/17/2005	Pumping Station	Standing water in pit 4 to 5'; 3" sludge, strong odor	Sludge	--	--	μg/kg	<26,000	<26,000	<26,000	<26,000	<26,000	<26,000	<26,000	33	25,000	Yes	High Detection Limits[1]
B47-SS6	3/17/2005	Trench Drain	Sludge, dry to moist, caked (Dock 2 northwest)	Sludge	--	--	μg/kg	<5,200	<5,200	<5,200	<5,200	<5,200	<5,200	<5,200	33	25,000	No	--
B47-SS7	3/17/2005	Trench Drain	Moist to wet; caked (Dock 2 center)	Sludge	--	--	μg/kg	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	33	25000	Yes	High Detection Limits[1]
B47-Oil1	3/17/2005	55 gallon drum	Waste oil	Oil	--	--	mg/kg	<1	<1	<1	<1	<1	<1	<1	-	2	No	--
B47-W1	3/17/2005	Pumping Station	Standing water in pit 4 to 5'; 3" sludge, strong odor	Water	--	--	μg/L	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	0.5	3	No	--
B47-Wipe1	3/17/2005	Transformer	Transformer door	Wipe	Porous	Assumed Painted metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B47-Wipe2	3/17/2005	Transformer	Floor in front of transformer; staining present	Wipe	Porous	Concrete	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	Yes	Wipe Sample Insufficient for Characterization; Concrete core sample needed.
Building 72 - Dock 7																		
B72-SS1	3/15/2005	Floor Drain	Sample collected from strainer (center); Wet/strong odor	Sludge	--	--	μg/kg	<14,000	<14,000	<14,000	<14,000	<14,000	<14,000	<14,000	33	25,000	Yes	High Detection Limits[1]
B72-SS2	3/15/2005	Floor Drain	Sample collected from strainer (West); wet/debris	Sludge	--	--	μg/kg	<16,000	<16,000	<16,000	<16,000	<16,000	<16,000	<16,000	33	25,000	Yes	High Detection Limits[1]
B72-SS3	3/15/2005	Floor Drain	Sample collected from strainer (tool area); dry/hairy	Sludge	--	--	μg/kg	<6,400	<6,400	<6,400	<6,400	<6,400	<6,400	<6,400	33	25000	No	--
B72-Oil1	3/15/2005	55 gallon drum	Waste Oil	Oil	--	--	mg/kg	<5	<5	<5	<5	<5	<5	<5	-	2	Yes	High Detection Limits[1]
B72-Oil2	3/15/2005	Bucket	Single flush using Hyjet from aircraft (used hyget bucket from A/C)	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B72-W1	3/15/2005	Floor Drain	Sample from drain pipe/strainer; strong odor (floor drain liquids - center)	Water	--	--	μg/L	<63	<63	<63	<63	<63	<63	<63	0.5	3	Yes	High Detection Limits[1]
B72-W2	3/15/2005	Floor Drain	Sample from drain pipe/strainer; rusty-orange (floor drain strainer liquid - north)	Water	--	--	μg/L	<58	<58	<58	<58	<58	<58	<58	0.5	3	Yes	High Detection Limits[1]
B72-W3	3/15/2005	Storm Drain	Sample from exterior storm drain catch basin; clear/no sludge	Water	--	--	μg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	0.5	3	No	--
B72-Wipe1	3/15/2005	Pit cover	Collected from cover of pneumatic/electric pit	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B72-Wipe2	3/15/2005	Equipment	Hydraulic Mule control panel	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B72-Wipe3	3/15/2005	Work Area	RH Azrac (employee) Toolbox	Wipe	Porous	Assumed Painted metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B72-Wipe4	3/15/2005	Work Area	General counter top - Planning Center	Wipe	Porous	Assumed Painted metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B72-Wipe5	3/15/2005	Work Area	Mezzanine Stairway Handrail	Wipe	Non-porous	Assumed unpainted Metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B72-Wipe6	3/15/2005	Work Area	Top of used fluorescent bulb storage box	Wipe	Porous	Assumed Painted metal	$\mu g/100cm^2$	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--

Sample ID	Date	Location Description	Sampling Observation	Matrix	Porous/Non-Porous Assumption	Other Assumptions	Units	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	EPA Rec. RLs	TSCA Screening Levels	Rejected For Use	Reason Rejected
Building 84 - Machine Shops/Engine Rebuild																		
B84-SS1	3/17/2005	Floor Drain	Floor drain closest to oil storage area; oily sludge	Sludge	--	--	μg/kg	<7,100	<7,100	<7,100	<7,100	<7,100	<7,100	<7,100	33	25,000	No	--
B84-SS2	3/17/2005	Floor Drain	Floor drain near water jet system (machine shop)	Sludge	--	--	μg/kg	<3,800	<3,800	<3,800	<3,800	<3,800	<3,800	<3,800	33	25,000	No	--
B84-SS3	3/17/2005	Floor Drain	Inspection Area - wet sludge	Sludge	--	--	μg/kg	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	**14,000**	33	25,000	No	--
B84-SS4	3/17/2005	Floor Drain	E47 cleaning room - black sludge, wet	Sludge	--	--	μg/kg	<11,000	<11,000	<11,000	<11,000	<11,000	<11,000	<11,000	33	25,000	Yes	High Detection Limits[1]
B84-SS5	3/17/2005	Floor Drain	Former engine teardown room; dry, sediments	Sludge	--	--	μg/kg	<2,700	<2,700	<2,700	<2,700	<2,700	<2,700	<2,700	33	25000	No	--
B84-Oil1	3/17/2005	Oil Storage Area	HO-2 hydraulic oil	Oil	--	--	mg/kg	<50	<50	<50	<50	<50	<50	<50	-	50	No	
B84-Oil2	3/17/2005	Storage tank	Machining coolant waste	Oil	--	--	mg/kg	<5	<5	<5	<5	<5	<5	<5	-	2	Yes	High Detection Limits[1]
B84-Oil3	3/17/2005	55 gallon drum	Waste Oil near engine repair work area	Oil	--	--	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	2	No	--
B84-W1	3/17/2005	Floor Drain	Floor drain closest to oil storage area; liquid in drain pipe	Water	--	--	μg/L	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	0.5	3	Yes	High Detection Limits[1]
B84-W2	3/17/2005	Floor Drain	Floor drain near water jet system (machine shop)	Water	--	--	μg/L	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	0.5	3	Yes	High Detection Limits[1]
B82-Wipe1	3/17/2005	Transformer	Transformer station A-Door 7A	Wipe	Porous	Assumed Painted metal	μg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B82-Wipe2	3/17/2005	Work Area	Floor near electric pit in transformer room	Wipe	Porous	Concrete	μg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	Yes	Wipe Sample Insufficient for Characterization; Concrete core sample needed.
B82-Wipe3	3/17/2005	Transformer	Transformer 2 - bottom pad	Wipe	Porous	Concrete	μg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	Yes	Wipe Sample Insufficient for Characterization; Concrete core sample needed.
B82-Wipe4	3/17/2005	Work Area	Workbench table - computer station	Wipe	Non-porous	Assumed unpainted Metal	μg/100cm^2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	-	10	No	--
B82-Wipe5	3/17/2005	Floor Drain	Engine repair - PW 2000 storage shelf	Wipe	Non-porous	Assumed unpainted Metal	μg/100cm^2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	10	No	--

DL exceeds EPA Rec RLs
DL exceeds TSCA Screening Level
Detection exceeds TSCA

Sludge - 25 ppm (25,000 ug/kg) as defined in 761.61 (below which no cleanup is required for low-occupancy areas)
Used Oil - 2 ppm (2 mg/kg) as defined in 761.20 (definition of waste oil).
Non-Used Oil - 50 ppm (50 mg/kg)
Water - 0.5 ug/L for unrestricted use; TSCA 761.61 (also equal to the MCL)
Wipe - 10 ug/100cm2 - TSCA 761.61 high occupancy for non-porous surfaces.

[1] - Detection limits were evaluated for samples where Aroclors were non-detect in the entire sample by taking summing 1/2 the detection limit across all Aroclors and comparing that value to the Total PCBs screening value.

From 761.3
PCB-Contaminated means a non-liquid material containing PCBs at concentrations ≥50 ppm but < 500 ppm; a liquid material containing PCBs at concentrations ≥50 ppm but < 500 ppm or where insufficient liquid material is available for analysis, a non-porous surface having a surface concentration >10 μg/100 cm2 but < 100 μg/100 cm2 , measured by a standard wipe test as defined in §761.123.

Non-porous surface means a smooth, unpainted solid surface that limits penetration of liquid containing PCBs beyond the immediate surface. Examples are: smooth uncorroded metal; natural gas pipe with a thin porous coating originally applied to inhibit corrosion; smooth glass; smooth glazed ceramics; impermeable polished building stone such as marble or granite; and high density plastics, such as polycarbonates and melamines, that do not absorb organic solvents.

Porous surface means any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with a porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low-density plastics such as styrofoam and low-density polyethylene; coated (varnished or painted) or uncoated wood; concrete or cement; plaster; plasterboard; wallboard; rubber; fiberboard; chipboard; asphalt; or tar paper.
For purposes of cleaning and disposing of PCB remediation waste, porous surfaces have different requirements than non-porous surfaces.

Building (m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data** No. of Samples Retained	**Sampling Design** Sample Layout	Discrete/ Composite	No. of Samples Analyzed	**Sample ID** As Analyzed	**Total** No. of Samples Analyzed
10 (11,600 m²)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	9	B10-F-A	9
								B10-F-B	
								B10-F-C	
								B10-F-D	
								B10-F-E	
								B10-F-F	
								B10-F-G	
								B10-F-H	
								B10-F-I	
					High Probability Areas (see Figure 4)	Discrete	3	B10-F-1	3
								B10-F-2	
								B10-F-3	
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	42	B10-P-#	42
						Discrete (paint shop)	16	B10PS-P-#	16
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B10-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	4	See Figure 4	Discrete	15	B10-S-1 to 15	19
	- Liquids	Bulk/grab	Peristaltic Pump	1	See Figure 4	Discrete	15	B10-L-1 to 15	16
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	--	See Figure 4	Discrete	15	B10-G-1 to 15	15
	Dust (other surface)	Micro-Vac/Wipe		--	Judgmental /Figure 4	Discrete	4	B10-D-1 to 4	4
			Total	5		Total	120	Total	125

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m^2 of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data**	**Sampling Design**			**Sample ID**	**Total**
				No. of Samples Retained	Sample Layout	Discrete/ Composite	No. of Samples Analyzed	As Analyzed	No. of Samples Analyzed
11 (4,980 m^2)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	3	B11-F-A B11-F-B B11-F-C	3
					High Probability Areas (See Figure 5)	Discrete	2	B11-F-1 B11-F-2	2
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	26	B11-P-#	26
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B11-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	2	See Figure 5	Random Discrete from each Group + Trench Random G1 = Random G2 = Random G3 = Random G4 =	5	B11-S-G1-# B11-S-G2-# B11-S-G3-# B11-S-G4-# B11-S-Trench	7
	- Liquid	Bulk/grab	Peristaltic Pump	1	See Figure 5		5	B11-L-G1-# B11-L-G2-# B11-L-G3-# B11-L-G4-# B11-L-Trench	6
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	1	See Figure 5		5	B11-G-G1-# B11-G-G2-# B11-G-G3-# B11-G-G4-# B11-G-Trench	6
	Dust (other surfaces)	Micro-Vac/Wipe		3	Judgmental/ Figure 5	Discrete	1	B11-D-1	4
			Total	7		Total	48	Total	55

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data**	**Sampling Design**			**Sample ID**	**Total**
				No. of Samples Retained	Sample Layout	Discrete/ Composite	No. of Samples Analyzed	As Analyzed	No. of Samples Analyzed
12 (2,650 m²)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	3	B12-F-A B12-F-B B12-F-C	3
					High Probability Areas (see Figure 6)	Discrete	1	B12-F-1	1
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	16	B12-P-#	16
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B12-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	3	See Figure 6	Random Discrete from each Group Random G1 = Random G2 =	2	B12-S-G1-# B12-S-G2-#	5
	- Liquids	Bulk/grab	Peristaltic Pump	--	See Figure 6		2	B12-L-G1-# B12-L-G2-#	2
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	--	See Figure 6		2	B12-G-G1-# B12-G-G2-#	2
	Dust (other surfaces)	Micro-Vac/Wipe		4	Judgmental/ Figure 6	Discrete	1	B12-D-1	5
			Total	7		Total	28	Total	35

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data**	**Sampling Design**			**Sample ID**	**Total**
				No. of Samples Retained	Sample Layout	Discrete/ Composite	No. of Samples Analyzed	As Analyzed	No. of Samples Analyzed
13 (2,650 m²)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	3	B13-F-A B13-F-B B13-F-C	3
					High Probability Areas (see Figure 6)	Discrete	1	B13-F-1	1
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	16	B13-P-#	16
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B13-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	2	See Figure 6	Random Discrete from each Group Random G1 =	1	B13-S-G1-#	3
	- Liquids	Bulk/grab	Peristaltic Pump	1	See Figure 6		1	B13-L-G1-#	2
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	--	See Figure 6		1	B13-G-G1-#	1
	Dust (other surfaces)	Micro-Vac/Wipe		2	Judgmental/ Figure 6	Discrete	1	B13-D-1	3
			Total	5		Total	25	Total	30

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building				**Apex Data**	**Sampling Design**			**Sample ID**	**Total**
(m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	No. of Samples Retained	Sample Layout	Discrete/ Composite	No. of Samples Analyzed	As Analyzed	No. of Samples Analyzed
14 (3,810 m²)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	3	B14-F-A B14-F-B B14-F-C	3
					High Probability Areas (see Figure 7)	Discrete	2	B14-F-1 B14-F-2	2
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	20	B14-P-#	20
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B14-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	1	See Figure 7	Discrete	2	B14-S-1 to 2	3
	- Liquids	Bulk/grab	Peristaltic Pump	--	See Figure 7		2	B14-L-1 to 2	2
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	1	See Figure 7		2	B14-G-1 to 2	3
	Dust (other surfaces)	Micro-Vac/Wipe		3	Judgmental/ Figure 7	Discrete	2	B14-D-1	5
			Total	5		Total	34	Total	39

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data**	**Sampling Design**			**Sample ID**	**Total**
				No. of Samples Retained	Sample Layout	Discrete/ Composite	No. of Samples Analyzed	As Analyzed	No. of Samples Analyzed
15 (19,810 m^2)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	6	B15-F-A B15-F-B B15-F-C B15-F-D B15-F-E B15-F-F	6
					High Probability Areas (see Figure 8)	Discrete	3	B15-F-1 B15-F-2 B15-F-3	3
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	44	B15-P-#	44
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B15-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	1	See Figure 8	Discrete	13	B15-S-1 to 13	14
	- Liquids	Bulk/grab	Peristaltic Pump	2	See Figure 8		13	B15-L-1 to 13	15
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	1	See Figure 8		13	B15-G-1 to 13	14
	Dust (other surfaces)	Micro-Vac/Wipe		2	Judgmental/ Figure 8	Discrete	3	B15-D-1 to 3	5
			Total	6		Total	96	Total	102

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m^2 of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data** No. of Samples Retained	**Sampling Design** Sample Layout	Discrete/ Composite	No. of Samples Analyzed	**Sample ID** As Analyzed	**Total** No. of Samples Analyzed
29 (8,400 m^2)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	6	B29-F-A B29-F-B B29-F-C B29-F-D B29-F-E B29-F-F	6
					High Probability Areas (see Figure 9)	Discrete	3	B29-F-1 B29-F-2 B29-F-3	3
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	38	B29-P-#	38
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B29-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	--	See Figure 9	Random Discrete from each Group + 3 shown on map Random G1 = Random G2 = Random G3 = Random G4 =	7	B29-S-G1-# B29-S-G2-# B29-S-G3-# B29-S-G4-# B29-S-T1 B29-S-T2 B29-S-G2-6	7
	- Liquids	Bulk/grab	Peristaltic Pump	3	See Figure 9		7	B29-L-G1-# B29-L-G2-# B29-L-G3-# B29-L-G4-# B29-L-T1 B29-L-T2 B29-L-G2-6	10
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	--	See Figure 9		7	B29-G-G1-# B29-G-G2-# B29-G-G3-# B29-G-G4-# B29-G-T1 B29-G-T2 B29-G-G2-6	7
	Dust (other surfaces)	Micro-Vac/Wipe		2	Judgmental/ Figure 9	Discrete	2	B29-D-1 to 2	4
			Total	5		Total	71	Total	76

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m² of floor)	**Matrices**	**Sample Type**	**Sample Method**	**Apex Data** No. of Samples Retained	**Sampling Design** Sample Layout	Discrete/ Composite	No. of Samples Analyzed	**Sample ID** As Analyzed	**Total** No. of Samples Analyzed
47 (22,890 m²)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	9	B47-F-A B47-F-B B47-F-C B47-F-D B47-F-E B47-F-F B47-F-G B47-F-H B47-F-I	9
					High Probability Areas (see Figure 10)	Discrete	4	B47-F-1 B47-F-2 B47-F-3 B47-F-4	4
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	64	B47-P-#	64
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B47-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	3	See Figure 10	Random Discrete from each Group + 2 shown on map Random G1 = Random G2 = Random G3 = Random G4 =	6	B47-S-G1-# B47-S-G2-# B47-S-G3-# B47-S-G4-# B47-S-T1 B47-S-T2	9
	- Liquids	Bulk/grab	Peristaltic Pump	1	See Figure 10		6	B47-L-G1-# B47-L-G2-# B47-L-G3-# B47-L-G4-# B47-L-T1 B47-L-T2	7
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	--	See Figure 10		6	B47-G-G1-# B47-G-G2-# B47-G-G3-# B47-G-G4-# B47-G-T1 B47-G-T2	6
	Dust (other surfaces)	Micro-Vac/Wipe		1	Judgmental/ Figure 10	Discrete	3	B47-D-1 to 3	4
			Total	5		Total	99	Total	104

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

<table>
<tr><th rowspan="2">Building
(m² of floor)</th><th rowspan="2">Matrices</th><th rowspan="2">Sample Type</th><th rowspan="2">Sample Method</th><th>Apex Data</th><th colspan="3">Sampling Design</th><th>Sample ID</th><th>Total</th></tr>
<tr><th>No. of Samples Retained</th><th>Sample Layout</th><th>Discrete/ Composite</th><th>No. of Samples Analyzed</th><th>As Analyzed</th><th>No. of Samples Analyzed</th></tr>
<tr><td rowspan="12">72
(2,320 m²)</td><td rowspan="4">Concrete Floors</td><td rowspan="4">Bulk (drill cuttings)</td><td rowspan="6">USEPA SOP for Sampling Porous Surfaces</td><td rowspan="4">--</td><td rowspan="3">Systematic grid (50-m by 50-m)</td><td rowspan="3">Discrete</td><td rowspan="3">3</td><td>B72-F-A</td><td rowspan="3">3</td></tr>
<tr><td>B72-F-B</td></tr>
<tr><td>B72-F-C</td></tr>
<tr><td>High Probability Areas (see Figure 11)</td><td>Discrete</td><td>1</td><td>B72-F-1</td><td>1</td></tr>
<tr><td>Painted Walls (interior)</td><td>Bulk (chip)</td><td>--</td><td>Random</td><td>Discrete</td><td>22</td><td>B72-P-#</td><td>22</td></tr>
<tr><td>Caulking (if present)</td><td>Bulk</td><td>--</td><td>Systematic</td><td>Composite (8-to-1)</td><td>1</td><td>B72-C-Comp</td><td>1</td></tr>
<tr><td colspan="9">In-Floor Drain/Utility Vaults</td></tr>
<tr><td>- Sediment/soil</td><td>Bulk/grab</td><td>Stainless Scoop</td><td>1</td><td>See Figure 11</td><td rowspan="3">Discrete</td><td>2</td><td>B72-S-1 to 2</td><td>3</td></tr>
<tr><td>- Liquids</td><td>Bulk/grab</td><td>Peristaltic Pump</td><td>1</td><td>See Figure 11</td><td>2</td><td>B72-L-1 to 2</td><td>3</td></tr>
<tr><td>- Floor Drain Grates</td><td>Wipe</td><td rowspan="2">ASTM D6966-08 and/or D7144-05a</td><td>--</td><td>See Figure 11</td><td>2</td><td>B72-G-1 to 2</td><td>2</td></tr>
<tr><td>Dust (other surfaces)</td><td>Micro-Vac/Wipe</td><td>6</td><td>Judgmental/ Figure 11</td><td>Discrete</td><td>3</td><td>B72-D-1 to 3</td><td>9</td></tr>
<tr><td></td><td></td><td>Total</td><td>8</td><td></td><td>Total</td><td>36</td><td>Total</td><td>44</td></tr>
</table>

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Building (m² of floor)	Matrices	Sample Type	Sample Method	Apex Data: No. of Samples Retained	Sampling Design: Sample Layout	Sampling Design: Discrete/ Composite	Sampling Design: No. of Samples Analyzed	Sample ID: As Analyzed	Total: No. of Samples Analyzed
84 (61,320 m^2)	Concrete Floors	Bulk (drill cuttings)	USEPA SOP for Sampling Porous Surfaces	--	Systematic grid (50-m by 50-m)	Discrete	27	B84-F-A	27
								B84-F-B	
								B84-F-C	
								B84-F-D	
								B84-F-E	
								B84-F-F	
								B84-F-G	
								B84-F-H	
								B84-F-I	
								B84-F-J	
								B84-F-K	
								B84-F-L	
								B84-F-M	
								B84-F-N	
								B84-F-O	
								B84-F-P	
								B84-F-Q	
								B84-F-R	
								B84-F-S	
								B84-F-T	
								B84-F-U	
								B84-F-V	
								B84-F-W	
								B84-F-X	
								B84-F-Y	
								B84-F-Z	
								B84-F-AA	
					High Probability Areas (see Figure 12)	Discrete	2	B84-F-1	2
								B84-F-2	
	Painted Walls (interior)	Bulk (chip)		--	Random	Discrete	106	B84-P-#	106
	Caulking (if present)	Bulk		--	Systematic	Composite (8-to-1)	1	B84-C-Comp	1
	In-Floor Drain/Utility Vaults								
	- Sediment/soil	Bulk/grab	Stainless Scoop	4	See Figure 12	Discrete	18	B84-S-1 to 18	22
	- Liquids	Bulk/grab	Peristaltic Pump	--	See Figure 12		18	B84-L-1 to 18	18
	- Floor Drain Grates	Wipe	ASTM D6966-08 and/or D7144-05a	1	See Figure 12		18	B84-G-1 to 18	19
	Dust (other surfaces)	Micro-Vac/Wipe		2	Judgmental/ Figure 12	Discrete	Up to 10	B84-D-1 to 10	12
			Total	7		Total	200	Total	207

Footnote: Extraction Method – Liquid – EPA 3510/EPA 3520
All other media – EPA 3540/EPA 3545
Analysis Method – All media – EPA 8082 (Aroclors)/EPA 1668 (Congeners)

Summary of Existing and Proposed Sample Collection

			Apex Data	Sampling Design	Total
Phase of Sampling	**Building**	**Sample Type**	No. of Samples Retained	No. of Samples Analyzed	No. of Samples Analyzed
1	10 11 12 13 14 15 29 72	Concrete	--	52	52
		Paint	--	240	240
		Caulking	--	8	8
		Sediment/Soil	14	47	61
		Liquids	9	47	56
		Floor Drain Grates	3	47	50
		Dust	22	17	39
		Total	**48**	**458**	**506**
2	47 84	Concrete	--	42	42
		Paint	--	170	170
		Caulking	--	2	2
		Sediment/Soil	7	24	31
		Liquids	1	24	25
		Floor Drain Grates	1	24	25
		Dust	3	13	16
		Total	**12**	**299**	**311**

Matrices	Sample Layout	Discrete/ composite	Sampling Method	Analytical Method	Analytical Units	Site Specific Screening Levels
Floors	Systematic Grid + High Probability Areas	Systematic Grid = Discrete; High Probability Areas = Discrete	Core Samples: 1 inch diameter; 0.5 inch depth; 10 grams minimum per sample	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	mg/kg	TBD via Risk Assessment
Floors (SHHRA Support)	Co-located at core locations with PCB detections above TSCA Screening Levels	Discrete	Wipe samples; 100 cm^2 sampling area	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	µg/100 cm^2	TBD via Risk Assessment
Painted Walls (Interior)	Systematic	Discrete	Scrapings; 10 grams minimum per sample	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	mg/kg	TBD via Risk Assessment
Painted Walls (Interior) (SHHRA Support)	Co-located at systematic locations with PCB detections above TSCA Screening Levels	Discrete	Wipe samples; 100 cm^2 sampling area	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	µg/100 cm^2	TBD via Risk Assessment
Caulking	High Probability Areas	Composite (8:1) (if encountered)	Scrapings; 10 grams minimum per final composite sample	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	mg/kg	TBD via Risk Assessment
Dust	Rafters	Discrete	Micro-vacuum followed by Wipe samples; 100 cm^2 sampling area	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	µg/100 cm^2	TBD via Risk Assessment
Floor Drains (1)	High Probability Areas	Discrete	Wipe samples; 100 cm^2 sampling area	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	µg/100 cm^2	TBD via Risk Assessment
Sludge (1)	High Probability Areas	Discrete	Grab samples; 8oz glass jar	**Prep**: EPA 3540/EPA 3545 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	mg/kg	TBD via Risk Assessment
Liquids (1)	High Probability Areas	Discrete	Grab samples; 1 liter amber jar	**Prep**: EPA 3510/EPA 3520 **Analysis**: EPA 8082 (Aroclors)/ EPA 1668 (Congeners)	µg/L	TBD via Risk Assessment

Notes:
(1) Samples intended to be co-located at each selected feature

Units:
mg/kg = Milligrams per kilogram
µg/cm^2 = Micrograms per centimeter squared
µg/L = Milligrams per liter

Appendix A
Response to Comments Letter

Environmental
Resources
Management

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15 April 2011

Ms. Carmen Santos
PCB Coordinator
RCRA Corrective Action Office
Waste Management Division
USEPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Response to Comments to PCB Investigation and Risk Assessment Workplan
United Airlines San Francisco Maintenance Center
San Francisco, California

Dear Ms. Santos:

On behalf of United Airlines (United), ERM-West, Inc. (ERM) presents this *Response to Comments to PCB Investigation and Risk Assessment Workplan* (Response) for the San Francisco Maintenance Center (SFMC) at San Francisco International Airport (the "site") to address your comments received on 9 February 2011. Below you will find our responses to your comments, along with additional narrative provided to clarify the intended goals and procedures presented in the Workplan. ERM has also prepared a Workplan Addendum addressing the changes made to the sampling and analysis portions of the Workplan in response to your comments. This letter will also be provided as Appendix A to the approved Workplan Addendum.

COMMENTS AND RESPONSES

The following are the comments as provided by USEPA (in italics) with associated responses from ERM.

1. ***Risk Assessment Approach (PCB Work Plan, Sections 1.6 through 2.4).*** *In general, the conceptual site model, proposed receptors & exposure scenarios, and the toxicity assessment for the compounds of concern comport with USEPA's risk assessment guidance. We recommend that United and its consultants revisit the algorithm proposed for use in Appendix A for determination of the risk-based screening level germane to inhalation exposure. The proposed algorithm should be modified to remain consistent with USEPA's Risk Assessment Guidance (RAGs)*

for inhalation exposure (Subpart F). This updated approach supersedes existing guidance and endorses the use of the reference concentration (RfC) and inhalation unit risk value to more precisely assess putative impacts associated with contaminant exposure via inhalation. The approach can be modified for use in proposing risk-based screening levels and should be adopted in support of this assessment effort.

Appendix A of the PCB Workplan has been checked and is consistent with Subpart F of USEPA's Risk Assessment Guidance (RAGs).

2. ***Wipe Samples (PCB Work Plan, Sections 3.1, 3.1.1, and 3.1.2).*** *UA proposes to collect wipe samples from concrete areas where concrete core samples will be collected. The concrete core samples will be the quantitative samples for site characterization if collected and analyzed following the guidance in the "Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls" (USEPA Region 1) (PCB SOP). In this case, wipe samples would be qualitative. The release of PCBs is too old to use wipe standard tests for site characterization. Wipe samples of painted surfaces may provide an indication as to whether PCBs are on the immediate paint surface. However, actual dried paint samples must be collected from painted surfaces for site characterization. The October 2008 (Revision 3) version of the USEPA PCB SOP will be sent via a separate e-mail message.*

The Workplan states that follow-up wipe samples for concrete areas are not intended to be used for characterization and will only be collected if PCBs are found to be present in the discrete media samples above the Toxic Substances Control Act (TSCA) Screening Level. The wipe samples will be used in the human health exposure evaluation of the risk assessment. Other wipe samples presented in the Workplan are for dust and drain grate sample locations.

All of our samples will be collected following the methods presented in the above-referenced SOP.

3. ***Painted Surfaces and Concrete (PCB Work Plan, Sections 3.1, 3.1.1, and 3.1.2).*** *Please provide the rationale for the number of dried paint samples that will be collected from painted walls in SFMC Buildings where paint will be sampled. The size of the SFMC Buildings listed in Table 1 range from 25,000 to 680,000 square feet. The number of proposed concrete samples may not be sufficient to adequately characterize the concrete for PCBs in these large Buildings and properly determine if applied paint in these Buildings contain PCBs.*

Site-specific analytical data collected as part of a pilot study sampling event conducted at Buildings 12 and 13 were combined with statistical analyses to develop a more robust and scientifically defensible sampling program for both paint and concrete at the SFMC. The revised sampling program eliminates composite sampling for the paint and concrete samples and instead uses all collected samples as discrete samples. Additionally, the number of paint samples collected is revised to reflect the differences in building sizes. The revised program increases the total number of concrete samples analyzed from 46 to 94 and the total number of paint samples analyzed from 22 to 410. Additionally, ERM is proposing to conduct the sampling effort in a phased approach with the flexibility to modify the sampling program mid-course based on site-specific sampling results. This revised program is presented in detail in the Workplan Addendum.

If analysis of dried paint shows presence of PCBs at or above 50 mg/kg, concrete surfaces beneath the paint must be properly sampled following the USEPA PCB SOP.

This would be correct as outlined in the 2005 guidance. Conversely, if a statistically valid analysis of paint (chips only) indicates PCB levels are below 50 mg/kg, then it is more likely that PCBs were introduced into the paint during manufacturing and not impacted by another source. This would then classify the paint as a bulk product waste and further testing would not be required.

The SFMC Buildings in Table 1 show that these Buildings were constructed between 1930's and 1960's. Based on that information there is a high possibility for construction materials (other than caulk and paint) in these Buildings to contain PCBs; and that operations conducted at these Buildings likely involved use of PCB-containing materials (e.g., hydraulic oils) or equipment contaminated with PCBs.

As indicated in Section 1.1 of the Workplan, known uses of PCB-containing materials at the site were terminated in 1977. It is ERM's understanding that releases of PCBs at the site that constitute PCB remediation waste would have occurred prior to 18 April 1978, and that pursuant to 761.50(b)(3)(i), the Regional Administrator would not require cleanup:

- In any case in which the concentration of PCBs found at the site are less than 50 ppm; and
- If the concentrations of PCBs are greater than or equal to 50 ppm, unless site conditions were judged to pose an unreasonable risk.

We understand that the Regional Administrator may require United to issue a certification pursuant to 761.3 indicating that known uses of PCBs at the site were terminated in 1977 and that, should United voluntarily decided to clean up the site, PCB remediation waste would require management in accordance with 761.61.

ERM understands that PCBs in building materials introduced during the manufacturing of the material (for example paint or caulk) would not be classified as PCB remediation waste, but rather would be classified as a PCB bulk product waste only if the concentrations of PCBs in the material (e.g., paint or caulk) are greater than or equal to 50 ppm. In such cases, management of PCB bulk product waste would be required in accordance with 761.62. In the absence of managing PCB bulk product waste under 761.62(a), Performance-based disposal, or 761.62(b) Disposal in solid waste landfills, storage of PCB bulk product waste would require approval of the Regional Administrator under 761.62(c) Risk-based disposal approval. Therefore, any future application for risk-based disposal approval will include approval for the management of PCB bulk product waste.

In addition, ERM understands that PCBs in building materials introduced during the manufacturing of the material (e.g., paint and caulk) found to contain less than 50 ppm PCBs would not be classified as a PCB remediation waste, or a PCB bulk product waste, and therefore use, storage or disposal would not be regulated under TSCA 761.

ERM requests USEPA's confirmation and/or clarification of our interpretation of those aspects of the regulations outlined above in order that future proposed actions for the investigation and management of PCBs found at the site be developed consistent with a mutual understanding of applicable portions of TSCA regulations among USEPA, United, and ERM.

4. ***Caulking (PCB Work Plan, Section 3.1.3).*** *Please provide the justification for the approach proposed to sample caulk at the SFMC.*

As stated in the Workplan, previous investigations and site reconnaissance activities have not indicated the presence of caulking in the SFMC buildings. Although caulking does not appear to be present at the SFMC, procedures for sampling the caulking have been provided in the Workplan as a contingency. The proposed sampling approach presents collection of an eight-part composite sample to be collected for each distinct occurance of observed caulking. A composite approach is being used as a cost-effective method to screen for the presence of PCBs. If the composite sample exceeds the risk-based screening level, then each of the eight discrete samples used for the composite will be analyzed individually to characterize the presence of PCBs in the caulking. The resultant discrete sample results would then be directly compared to the TSCA standard.

The caulking sampling approach has been designed in consideration of the USEPA's (2010) recommendation that a minimum of 8 to 10 samples is needed to estimate exposure point concentrations in risk assessment. The collection of 8 samples along a given length of caulking (if observed) allows for cost-effective composite sampling followed by discrete sampling (if warranted) at a data density that is representative and adequate for risk assessment. Our proposed sampling approach assumes that the maximum length of each occurance of caulking will be 32 linear feet which represents an approximate length of caulking around a typical door or window at the SFMC. In the event that a given occurance of caulking exceeds this length, then the caulking will be characterized in multiple segments.

5. ***In-Floor Drains and Utility Vaults (PCB Work Plan, Section 3.1.4).*** *Table 2 summarizes characterization data for different materials and media at several SFMC Buildings. Table 1 provides the square footage for Buildings included in Table 2. Based on the information provided in Tables 1 and 2 provide justification for the number of drains that will be sampled for sediments, sludges, water, and/or oil.*

As stated in the workplan, we propose to collect verification samples at previous TSCA exceedences along with upstream and downstream locations. In areas where previous screening did not identify PCBs, a single drain was randomly selected from within each group of related drains as shown on the figures in the Workplan. This approach is appropriate for a screening-level characterization because all drains within a group are innerconnected and previous screening did not identify PCBs in these areas.

6. ***Table 2, "Summary of 2005 APEX Screening San Francisco."*** *Table 2 identifies previous APEX site characterization data that has been rejected and data that will still be considered to prepare the PCB risk- based disposal application. Table 2 refers to PCB cleanup levels that are specified as such in 40 CFR 761.61(a) and decontamination levels in 40 CFR 761.79 as "TSCA Screening Levels." Please clarify if these cleanup and decontamination levels are being used in addition to the PCB analytical detection limit in USEPA Method 8082A to decide which APEX data is being rejected.*

The analytical detection limits have been compared to the TSCA Screening Levels to determine if the data collected previously were sufficient or should be rejected.

Analytical results for oil should be compared to the 2 mg/kg PCBs and not to 50 mg/kg PCBs. TSCA regulates waste oil to a level equal to or above 2 mg/kg.

Upon further review of the 2008 workplan, it appears the statement "oil samples presented were collected from unused aircraft maintenance fluids such as hydraulic fluids, lift gates, waste oil storage areas, and elevator system accumulators" was misunderstood. Not all samples previously collected were from unused oils. Therefore, Table 2 has been revised to provide comparison to the TSCA waste oil screening level of 2 mg/kg, where appropriate. The revised table is provided in the Workplan Addendum.

Analytical results for water containing PCBs should be compared to the TSCA 0.5 µg/L PCB level for unrestricted use of the water, or to the PCB concentration in the permit for the POTW receiving waste water from UA's SFMC or the PCB limit in the SFMC's waste water treatment plant permit, whichever is more stringent.

United does not currently have a discharge permit, because we discharge to the industrial waste treatment system at San Francisco International Airport (SFIA). SFIA has issued a letter to United stating they must comply with SFIA's Waste Discharge Requirements (WDRs) under Regional Water Quality Control Board Order R2-2007-0060. This Order does not specify PCB effluent limitations.

According to Title 40 of the Code of Federal Regulations, Part 761.79(b)(1) *Decontamination Standards*, the decontamination standard for water containing PCBs is:

- (b)(1)(ii) For water discharged to a treatment works or to navigable waters, <3 µg/L (approximately <3 ppb) or to a PCB discharge limit included in a permit issued under section 307(b) or 402 of the Clean Water Act.

Since all drainage waters at the facility are directed to the onsite treatment plant, SFIA's treatment plant, and ultimately discharged to the San Francisco Bay, 3 µg/L was selected as the standard to which the data were compared.

Please confirm if additional samples will be collected in those areas for which the APEX data was rejected due to high detection limits.

It is not ERM's intent to recreate previously rejected data. If the rejected data would fill a data gap, then we have included a similar sample in the proposed Workplan.

Based on Table 2, "sludges" are impacted with PCBs (e.g., "sludge" from Building 15 contained 1,100 mg/kg PCBs) at the SFMC. We recommend that "sludges" be re-sampled and that extracted "sludge" samples be subject to the most effective sample cleanup procedure before analysis via Method 8082A. We recommend a more thorough and complete characterization of "sludges" be conducted at the SFMC. Based on relevant and appropriate testing, are the materials that UA is classifying as "sludges" a liquid or a non-liquid material? Please explain how UA determined the material tested from drains is a "sludge." For "sludges" from which water can be decanted, was the water analyzed separately from the solid phase in the "sludge." Please explain.

What material is UA classifying as "sediment" and how does that material defer from that which UA is classifying as "sludge."

The historical "sludge" and the proposed "sediment" samples are essentially the same medium. The medium is collected from the floor drain basket strainers. These strainers act as sediment traps and hold approximately 2 liters of water before overflowing into the drainage piping below the floor of the building. The sludge/sediment material is composed mostly of gritty sediments, small trash debris, small nuts and bolts, and other particles that have been deposited on the floor and ultimately washed down the drain. The floors in these buildings are typically washed with a Zamboni-type floor-cleaning machine every day.

During sampling of the floor drains, the water in the strainer is drawn off and placed in sample containers prior to scooping out the sediment for sampling.

Proposed sediment samples will be extracted and cleaned up using Method 3546 prior to analysis using Method 8082A.

7. ***Painted or Coated Metal.*** *Metal surfaces that are coated with paint are considered a porous surface. Testing of the paint via collection of dried paint samples may be necessary and wipe samples may not be sufficient to characterize coated metal surfaces.*

Painted metal surfaces sampled as part of this supplemental investigation are limited to hangar doors in some of the buildings. The samples from the hangar doors consist of paint chips scraped from the hangar door. As stated in the Workplan and the Workplan Addendum, wipe samples will only be collected from the painted surfaces if PCB detections in the paint samples exceed the TSCA screening levels, and will not be used for characterization but rather for the Screening Human Health Risk Assessment (SHHRA).

8. ***Sample Size.*** *UA must verify that sample sizes are adequate for all materials that will be analyzed via USEPA Method 8082A. Please check the Method 8082A and the chosen extraction method requirements for sample size.*

Neither USEPA Method 8082A nor the extraction methods provide a recommended sample collection size. However, conversations with analytical laboratories indicate the sample sizes proposed in this Workplan are sufficient to provide adequate sample for extraction and analysis to the required detection limits.

9. ***Collection of Dust Samples (PCB Work Plan, Section 3.1.5).*** *The PCB Work Plan states that dust samples will be collected "where dust is observed in sufficient amounts" and that dust samples will be collected via wipes. We recommend that in addition to wipe samples that bulk dust samples be collected (2 grams or more per sample if possible) using clean stainless steel tools and that amber vials with Teflon-lined cap be used as sample containers. UA may propose an alternate bulk dust collection method.*

Since we are proposing to collect dust samples in areas "where dust is observed in sufficient amounts," ERM acknowledges that wipe sampling alone may not be sufficient. Therefore, micro-vacuum sampling methods will be used (ASTM Method D7144-05a) followed by wipe sampling in the same sample area. Both samples will be analyzed and the results will be combined to provide a total dust sample concentration. This dust-sampling approach is prescribed specifically for metals determination, but has been adapted for PCB characterization.

10. ***Table Summarizing Additional Site Characterization Samples.*** *Please provide a table summarizing location, number of samples, types of samples (discrete or composite), extraction and analysis methods, sample collection procedures, and sampling medium.*

Table 7 in the Workplan has been modified to include this information as requested.

11. Sampling Plan. *Please submit a sampling plan for review and approval if not submitted already.*

It is our intention that the Workplan and the Workplan Addendum serve as the Sampling Plan for the characterization of PCBs at the SFMC. These documents include all the elements typically included in a Sampling Plan, including the following:

- Proposed sample locations;
- Sample media;
- Sample collection procedures;
- Quality assurance/quality control procedures;
- Sample equipment decontamination;
- Sample handling and documentation; and
- Laboratory analysis.

CLOSING

United appreciates USEPA's review and comments on the proposed PCB Investigation and Risk Assessment Workplan. Your input has assisted us in developing a more robust and comprehensive plan for characterizing the presence of PCBs at the SFMC. We look forward to receiving your approval of the Workplan and Workplan Addendum in the near future so we can proceed with the supplemental site characterization activities. Should USEPA want to meet to discuss any of the information contained within this letter or the Workplan Addendum, a United representative will be in the San Francisco Bay Area during the first week of May.

If you have any questions concerning the activities presented in this letter please contact Debbie Lind at (925) 946-0455.

Sincerely,

Debbie S. Lind | Jim Warner

Debbie Lind, P.G.
Project Manager

Jim Warner, P.G.
Principal-in-Charge

DSL/JBW/kmm/0122245

Appendix B
Simulations Conducted to Support Sampling Efforts

APPENDIX B SIMULATIONS CONDUCTED TO SUPPORT SAMPLING EFFORTS

1.0 INTRODUCTION

The analytical results for total PCBs in paint on interior walls and concrete floors were statistically evaluated in support of the overall sampoing program design. Decision-making regarding appropriate sampling density was predicated upon determining whether upper bound concentrations of Total PCBs in media (e.g., paint on interior walls, concrete floors) exceed the threshold of 50 milligrams per kilogram (mg/kg). The goal of the evaluation is to use site-specific data and statistical analysis to identify the sample size that will adequately characterize the upper bound concentration of Total PCBs with sufficient confidence to support decision-making. This appendix presents the methods used in conducting this evaluation, conclusions regarding the evaluation, and literature references cited in conducting the statistical simulations.

2.0 METHODS

The methods for analyzing pilot study data to support the selection of an adequate sample size (i.e, sample density) are presented below.
Key elements of the analysis include:

- Construct representative data distributions for Total PCBs;
- Simulate field sampling; and
- Calculate upper bound concentrations and plot as a function of sample size.

Box B-1 describes steps of the analysis that are described further in this section of the appendix.

Box B-1. *Steps of the Analysis*

Step	Description
1.	Construct representative data distribution.
2.	Randomly sample from the representative data distribution eight times (N = 8, Run 1).
3.	Calculate upper bound Total PCB concentration for the Run.
4.	Repeat Steps 2 and 3 an additional 19 times (Runs 2 through 20).
5.	Increase sample size and repeat Steps 2 through 4 for sample sizes up through 32 samples.
6.	Plot upper bound Total PCB concentration as a function of sample size.

The random sampling for the analysis was simulated using Crystal Ball®. ProUCL 4.01, USEPA's statistical software, was used to visualize the pilot study data distributions and calculate descriptive statistics.

2.1 Construct Representative Data Distributions for Total PCBs

The site-specific pilot study data were used to construct representative data distributions for Total PCB concentrations in paint and concrete floors. The pilot study data were collected in two hangers (Building 12 and Building 13) at the San Francisco Maintenance Center (SFMC).

A total of sixteen (16) discrete paint samples and eight (8) discrete concrete floor samples from the pilot study were used to construct data distributions for Total PCB concentrations in paint and concrete floors, respectively, which were assumed to represent Total PCB concentrations in the subject SFMC buildings. Descriptive statistics of pilot study data are presented in Table B-1.

Table B-1. *Pilot Study – Descriptive Statistics*

Type	N	Min	Max	Mean	Std Dev	CV	Distrib
Paint	16	1.6	41	11	9.7	87%	Lognorm
Concrete Floor	8	1.6	4.1	3.3	1.3	39%	Normal

Notes:
N = sample size
Min/Max = minimum concentration / maximum concentration (mg/kg)
Std Dev = standard deviation (mg/kg)
CV = coefficient of variation (= standard deviation / mean)
Distrib = distribution of the data
Lognorm = lognormal

Representative data distributions for Total PCBs in paint and the concrete floor are shown in Figures B-1 and B-2, respectively.

Figure B-1. Pilot Study – Histogram of Total PCBs in Paint Samples

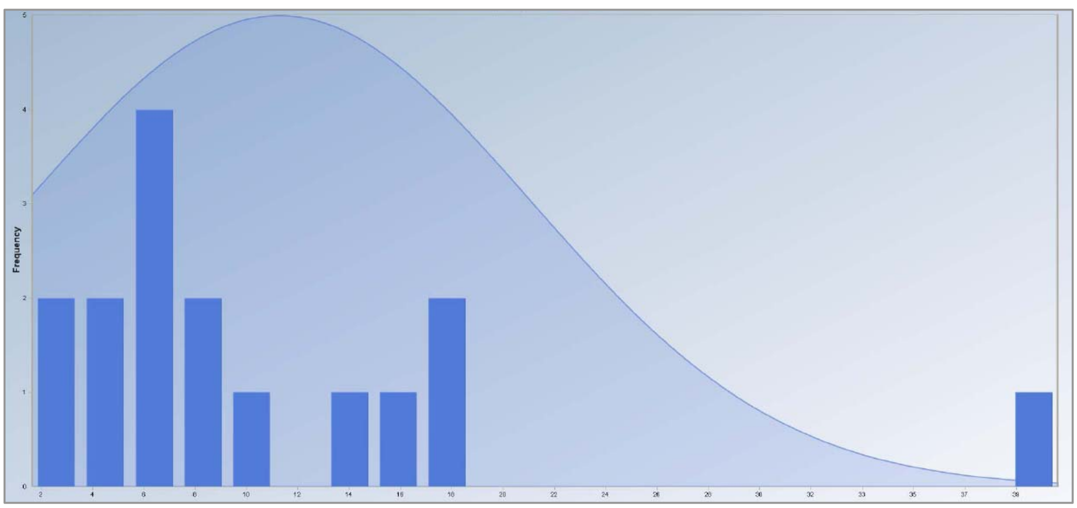
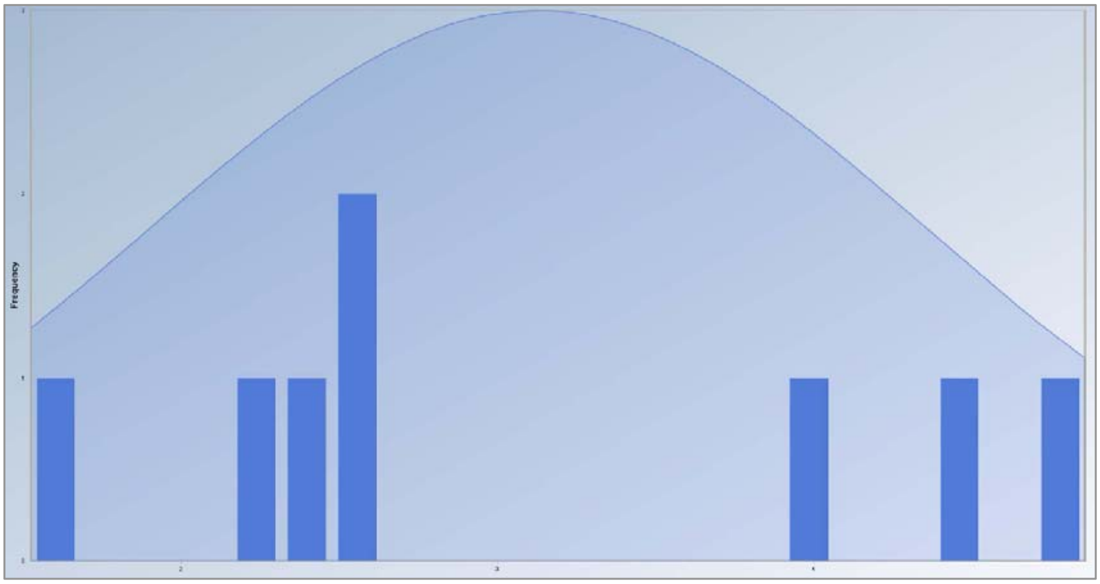


Figure B-2.   Pilot Study – Histogram of Total PCBs in Concrete Floor Samples



For paint, the distribution of Total PCB concentrations is lognormally distributed (Figure B-1). For concrete floors, the distribution of Total PCB concentrations is normally distributed (Figure B-2).

2.2 *Simulate Field Sampling*

Using these data distributions derived from site-specific data, random sampling was simulated using Crystal Ball® for the following sample sizes (sampling effort) per building:

- 8 samples
- 12 samples
- 16 samples
- 20 samples
- 24 samples
- 28 samples
- 32 samples

As presented in Box B-1, twenty simulation runs per sample size were conducted to form the basis for characterizing the upper bound estimate of the Total PCB concentrations in paint and concrete floors.

2.3 *Calculate Upper Bound Concentrations of Total PCBs and Plot as a Function of Sample Size*

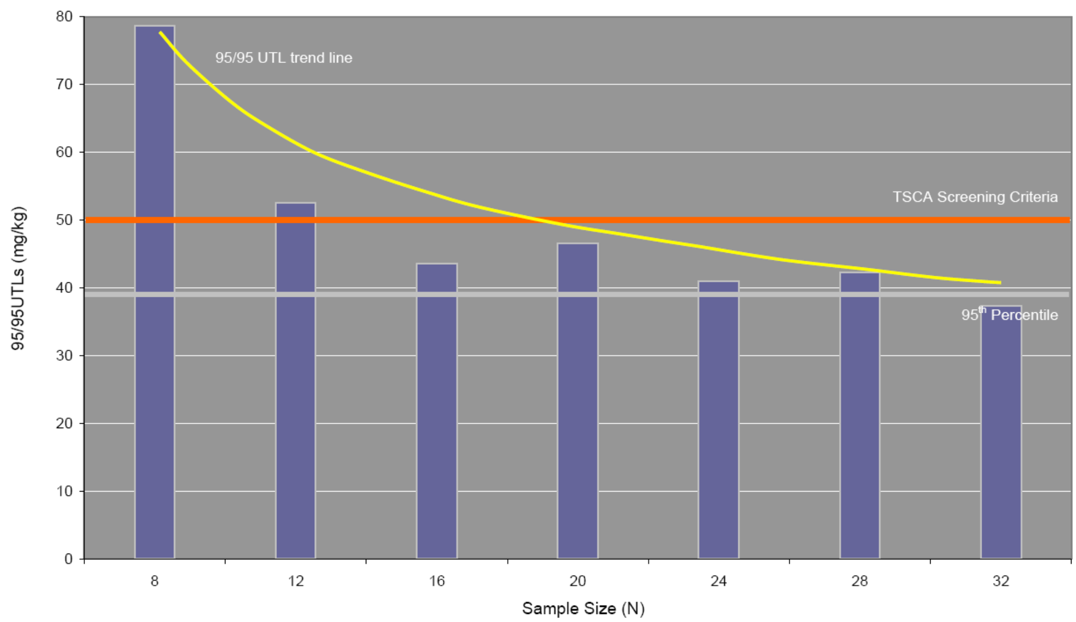
Upper threshold limits (UTLs) are supported by regulatory guidance and are commonly used to estimate an upper bound for populations of data

(USEPA 2006, 2009, 2010). The 95/95 UTL is defined as the 95 percent upper confidence limit of the 95th percentile of the population. In other words, the 95/95 UTL is the value at or below which 95 percent of the data exist with 95 percent confidence. Accordingly, for purposes of this analysis, the 95/95 UTL is considered a commonly used, acceptable and defensible upper bound of Total PCBs in paint and concrete floors.

To ensure conservative 95/95 UTLs, the distribution of Total PCB concentrations in paint and concrete floors were considered to be lognormally distributed. Accordingly, 95/95 UTLs calculated by USEPA's ProUCL for lognormally distributed data were used.

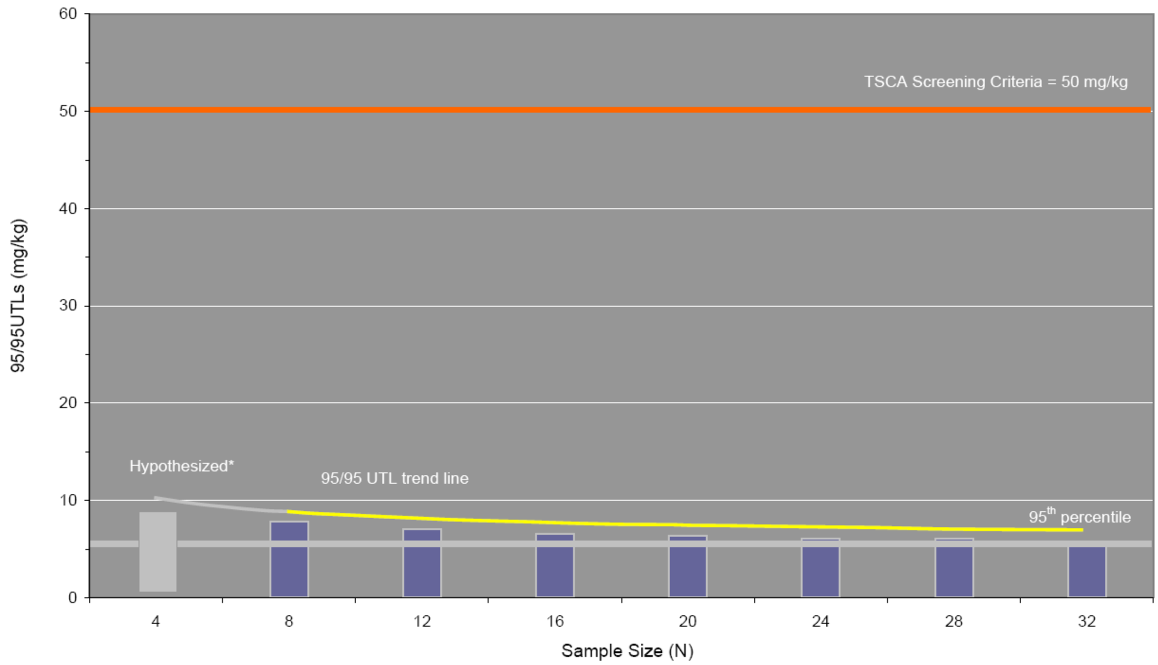
Plots of the upper bound of Total PCB concentrations[1] in paint and concrete floors as a function of sample size are shown in Figures B-3 and B-4, respectively.

Figure B-3. *Pilot Study – Estimate of Upper Bound Concentrations (95/95 UTLs) for Total PCBs in Paint Samples*



[1] Note that average 95/95 UTLs for each sample size are plotted without ± 95 percent error bars to avoid confusion related to "too many" estimates of confidence–i.e., to avoid confusion attributed to 95 percent upper confidence in 95 percent upper confidence of the 95th percentile.

Figure B-4. *Pilot Study – Estimate of Upper Bound Concentrations (95/95 UTLs) for Total PCBs in Concrete Floor Samples*



* ProUCL does not recommend and will not calculate a 95/95 UTL for sample sizes less than five

3.0 *CONCLUSIONS*

The site-specific data simulations presented herein for Total PCBs in paint support the following conclusions:

- The maximum detected concentration of Total PCBs in paint was 41 mg/kg—less than the TSCA screening value of 50 mg/kg.
- The upper bound of Total PCB concentrations in paint decrease with increasing sample size.
- There is a diminishing return on improved estimates of upper bound concentrations of Total PCBs in paint with increasing sample size.
- The point of diminishing return appears to be in the range of 16 samples per building.

The site-specific data simulations presented herein for Total PCBs in concrete support the following conclusions:

- The maximum detected concentration of Total PCBs in concrete floors was 4.1 mg/kg—considerably less than the TSCA screening value of 50 mg/kg.
- The upper bound estimates of Total PCB concentrations in concrete floors are well below the TSCA screening value at all sample sizes/sampling efforts.
- The upper bound of Total PCB concentrations in concrete floors decrease with increasing sample size.
- There is a diminishing return on improved estimates of upper bound concentrations of Total PCBs in paint with increasing sample size.
- Based on extending the trendline, we hypothesized an anticipated upper bound concentration of Total PCBs in concrete floors for a minimum sampling effort of four (4)[2] samples per building would also be well below the TSCA criteria.

[2] Note that USEPA (2010) does not recommend and ProUCL will not calculate a 95/95 UTL for less than five (5) samples.

These conclusions are based on the following assumptions:

- Pilot data are representative of Total PCB concentrations in other hangers at the SFMC.
- The 95/95UTL is an acceptable upper bound estimate of Total PCB concentrations.

The analysis of pilot study data suggests that:

- Based on diminishing return, a minimum number of 16 samples per building is considered to be adequate and defensible to characterize upper bound concentrations of Total PCBs in paint on interior walls; and
- A minimum number of four samples for each of Buildings 12 and 13 confirm the approach of collecting one floor sample in each square of a 50 meter grid superimposed on each building footprint to provide an adequate and defensible quantity of samples to characterize upper bound concentrations of Total PCBs in concrete floors.[3]

[3] For concrete floors, even when extrapolating the trend line to four samples per building, the upper bound concentration is well below the threshold of 50 mg/kg.

4.0 LITERATURE CITED

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